SURVIVAL

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Elements of a New World

From the Mid-Century Challenge to United States Foreign Policy

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The following extracts are from a wide ranging survey of the problems confronting American policy, the fifth in a series of studies called 'America at Mid-Century' which have attracted wide attention by reason of their authority and breadth of view. The panel responsible for this particular report was under the Chairmanship of Mr Dean Rusk, President of The Rockefeller Foundation and a former Assistant-Secretary of State.

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IN A WORLD changing rapidly it is important to discern the next phase as well as to grasp the fundamentals of the present one. In this section of the report, we put down some of the big things that seem to be happening. They set the stage for the problems with which the next phase of foreign policy must deal. They are capable of being affected in their impact and in the speed of their development by deliberate choices of policy.

The Decline of the Nation-State

The nation-state as it was conceived in the sixteenth century and as it has existed throughout the modern age is now transforming itself. In this report it has been necessary to talk in terms of nations as if they were still the solid entities, water-tight and sovereign, which traditional theory describes. In fact, they have not been that for a long time. The growth of the modern world has seen the interdependency of nations and communities increase to a point where independence, at least in the sense of self-sufficiency, is seriously eroded. If the United States were to be confronted with the necessity of existing apart from the trade of the world, apart from its intellectual and spiritual currents, and the support of allied and kindred nations, it would quickly realize that independence can be pushed too far.

The modification of the nation-state has been confused by the fact that the aspirations of peoples all over the globe are today finding expression in the slogan of nationalism. What animates these peoples is a resolve to emerge rapidly and conclusively from the era of colonialism. They are going somewhere, but it is a real question whether they are going where they think they are. Many of them simply would not possess in any circumstances the prerequisites of self-sufficient nationhood. They certainly do not possess them in a day when even the most firmly established states find many insufficiencies within their own borders and a constant necessity to enlarge the definition of their interests. In a deep way, emerging states seem to recognize the inadequacy of their avowed goal. Even while they affirm their nationalism they grope towards those larger groupings in which alone they can hope to find their needs met.

The new nationalism may thus be a halfway house. It may provide a point in the line of the rapidly evolving development of the former colonial peoples. But it is not a resting place where men can hope to build viable communities for themselves and for their children.

The eating away of the national idea has been brought about by a world-wide economic system, the essence of which makes it impossible for a state to find sufficiency within its own borders. It has been brought about also perhaps most dramatically by new developments in weapons and warfare. In classic theory the essence of the state – in addition to economic self-sufficiency – was its defensibility. It comprised a territorial expanse internally pacified and outwardly defended. Order within and a reasonable security against invasion from without: these were the opposite sides of the coin of nationhood. Smaller nations have long had to accommodate their thinking to the fact of vulnerability, but the development of air warfare blurred the significance of borders for large states as well. Even then it was possible in theory to stop the airborne invader over the frontier. The coming of the missile age, and with it the seeming impossibility of keeping the homeland from being penetrated, will complete the process which is making the modern nation an open and exposed, rather than a tightly bounded, territorial unit.

In another way the new weapons have accelerated the erosion of nationalism. The technological skill and financial resources necessary to develop these weapons and to produce suitable delivery systems reinforced the tendency towards a bipolar world – a world, that is, with two super-powers in juxtaposition to each other. Without atomic weapons, the United States and Russia would no doubt have found themselves thus opposed, with a superiority of power dwarfing other nations. In the nineteenth century, Tocqueville already discerned that outcome. But for the past decade this bipolarity has been linked with the new weaponry, and in that period the two super-powers have as by an irresistible force transformed not only their own nature but the nature of the states and nations grouped around them.

American security is now meaningless apart from the security of the free world. From our point of view, the American territory remains as an inner citadel, but for all practical purposes the United States' defence area is far wider. Within these boundaries of the free world, other nations have kept their integrity and freedom; but their own responsibilities for defence have been transformed. They have been conscious, moreover, of varying degrees of mutual constraints and interdependency.

As for the relations of the countries within the communist orbit, subjection has been the normal course. Yet it would be a mistake to ignore how the Soviet leadership has been compelled by the forces of nationalism and self-determination to grant varying degrees of autonomy. The satellite countries present something less than a uniform subjection. Khrushchev's hints (in Leipzig, March 7, 1959) of a new commonwealth structure for the Soviet bloc deserve attention.

If the bipolarity of the past decade diminishes significantly, the relations between states will once again alter. But the effects of recent historical experience will not be lost. The nations will still find themselves linked in regional groupings of various sizes and varying degrees of integration. It will be difficult for them to affirm the kind of independence which they possessed, at least in theory, up to the division of world power between the United States and the Soviet Union.

The combinations that will then become possible are suggested by the richness of international life which has grown up, to some extent unnoticed, in the past decade and a half. Nations have not only been finding new affinities within the overarching structure of the two great super-powers; they have also been working out new relationships as a consequence of economic and technological forces. The nation-state in its existing form has not permitted certain vital functions to be adequately or efficiently fulfilled. Markets have not proved large enough. Sources of raw materials and credit have not been organized on a sufficiently broad or stable base. Accordingly, we have seen developing a wide variety of institutions, reaching across the old border-lines. Sovereignty has been relaxed in specific fields, but experience is proving that by voluntary pooling of efforts for certain ends, the nations are not diminished in any essential way, but rather gain an enhancement of what

they have. Real power is increased as the meaning of sovereignty is re-interpreted. . . .

A New Power Structure

A world situation characterized by the rivalry of two superpowers, the United States and Russia, will almost certainly not last. This report is written in what may well prove, when men can look back, to have been the twilight of bipolarity. The pre-eminence of these two great centres with their scientific skills, their advanced technology, their large highly organized populations, seems for the time being to be part of a continuing and even natural scheme of things. It is, on the contrary, highly unnatural and is surely destined to be impermanent.

The transformation of the existing structure is coming about through factors we have already noted. The rise of a united Western Europe and of a highly organized China are the most obvious signs that the polarizing forces existing in the postwar period are beginning to abate. But if we look beyond the 1960's into the remaining decades of the twentieth century, we are bound to feel that the shape of things will have been altered in all kinds of ways that are impossible to foresee except in broadest outline. The rapid progress which the underdeveloped countries have set as their goal – and which they must attain if they are not to slip backwards into chaos worse than the poverty from which they are emerging – will begin to tell in the scales of world power. The new sources of energy which the industrialized countries stand ready to put at their disposal will have given them capacities which, in the normal course of development, would have been wholly beyond their reach. Taking over forms of technology and organization laboriously worked out over centuries in the Western world, some may be able to leap over decades of experimentation and discovery to stand in the ranks of the modern world.

It is difficult to make predictions in this area partly because the nature of strategic power is undergoing a transformation and we do not yet have enough experience to assess the results. Many elements which formerly gave a nation a power status may have the opposite effect in the missile age. Thus, invulnerability has been a source of power; Great Britain's immunity to invasion was the basis of its first greatness. But seas and distances, however significant, will not provide immunity in future wars. Moreover, industrialism itself, with the concentration of population and resources which goes with it, may prove a severe handicap. How can one compare the strategic power of a small industrialized country, for example, with that of a relatively less developed nation where wide lands and scattered populations provide no easy targets? We actually do not know the answer to such a question, but the very fact that it can be seriously asked indicates how far the power situation is beginning to alter.

Nor do we know as yet what will be the effect on relative power of the increasing populations of Asia and, to a less extent, of other underdeveloped areas. The assumption is often made that the weight of nations in the world scale is roughly related to their population. This is highly questionable, especially where population growth is not due to any inherent ferment or vigour, but to medical advances drastically reducing infant mortality.

Power in a confused and negative sense may conceivably accrue to crowded nations. A capacity for mischief may well increase beyond any capacity for effective or constructive action. Lacking adequate resources and in a state of political instability, such nations may form part of a restless, jostling mass, condemning the age to violence and disorder. In such an environment, seething population growth could provide a ferment easily mistaken for power, and hordes of manpower could be a crude asset in warfare.

Those countries that are bringing population under control, as Japan has been doing, may in the last analysis be most likely to form significant power centres in the decades ahead. A high degree of national purpose and education on an increasing scale are among the elements which can help bring population into balance and make a higher standard of well-being possible.

Whatever the precise effects of new forms of military power or of population trends, the rising power of Asia and eventually Africa is plain to see. The solidarity at Bandung was the beginning of a political consciousness which casts long shadows into the future. Self-determination of the African peoples, as expressed at Accra, is a rapidly growing force. The world stage will be immensely enlarged as these new peoples and continents play a larger part. The international

order as it existed before the First World War, in some ways more efficient and highly organized than anything we have been able to construct since, was fashioned on a small scale, with the old states of Europe managing between them virtually all important matters. That day has passed. Only slowly, however, are we grasping the implications of a world in which forces hardly yet measurable and peoples still in political infancy form essential elements of the total structure.

The picture of the United States held at least unconsciously in the minds of Americans is that of a large continent, endowed with virtually unlimited resources, enjoying an easy power and favoured with a comfortably large and growing population. That picture will change in the decades ahead. In comparison with the vast, amorphous new regional groups now obtaining political expression, the outstanding fact about the United States may come to seem its compactness. Notable among its characteristics will be a high degree of skill, elaborate organization, a refined technology. Its conviction of self-sufficiency will be replaced by awareness of how greatly it is dependent on its relations with other countries for essential materials and for a supporting atmosphere in which it can breathe and be itself.

Education . . . will become an increasingly important element of our national strength. Not the power of masses, but the power of intelligence – groups schooled to excellence, disciplined and tempered in the exercise of widely decentralized responsibility – will be the source of such authority as America wields in that day. . . .

In such a new configuration of states and peoples, the United States will have a long-range objective which until now has been implicit rather than expressed. That objective will be to make sure that the world does not decline into a new bipolarity, this time more durable and more fearful in its implications, because based on colour rather than on ideology. Ideologies can be transformed with time; colour lines are fixed, if not permanently, at least for very many generations. The cold war with Russia is bitter to live with; but worse would be a rivalry in which men found themselves pitted against each other on lines of race or colour.

What Interdependence for NATO?

MALCOLM HOAG

From World Politics, April, 1960

Mr Hoag, who is an economist and a member of the staff of The Rand Corporation, is at present teaching at the National War College in Washington. This analysis of the difficulties, both economic and strategic, of making any progress towards a better system of interdependence and integration within NATO without a clearer concept of the aims of the alliance, has a direct bearing on the debate now going on in all the leading NATO countries – Britain, the United States, France, Germany and Canada – about their future weapons systems and defence policies.
(By permission of *World Politics*)

I

IN NATO's early days statesmen spoke glowingly about subordinating national military interests to a truly international 'Balanced Collective Force', a goal similar to classic free trade in its promise of mutual gain secured at the cost of dependence upon foreigners. Naturally, in so nationalistic a field as defence, achievement fell far short of this sweeping aspiration. But we are ill-placed now to belittle either the slogan or the degree to which we realized an international division of military labour. Nowadays the slogan is 'interdependence', but in practice this seems to mean performance deviating still more widely from the goal of integrated defence.

Currently, General De Gaulle supplies the dramatic examples. With France demanding greater voice in NATO political councils and military commands, resisting integrated European air defence, bargaining stiffly over the terms for American IRBM's, refusing American-controlled nuclear stockpiles on her territory, and, above all, determined to manufacture her own nuclear weapons, the challenge to interdependence is obvious. Yet France's vainglory is understandable and even admirable up to a point, and her stubbornness must not be taken to be the sole or even the main obstacle to efficient collective defence. Other allies are merely less obviously culpable. For NATO it is better to divert troops to Algeria than never to raise them at all, a concession that puts the contributions of some others in better perspective. And Britain long ago began the costly pursuit of prestige via an independent deterrent with its own nuclear weapons and delivery systems. More fundamentally, the main obstacle to efficient collective defence lies beyond vainglory. It lies in strategic conceptions, and not least in American ones.

Whether there is much point in discussing these strategic conceptions is the first question. Sometimes American actions seem to indicate that we don't care very much about efficient collective defence and, accordingly, worry little about the obstacles that impede achieving it. Yet at the same time we claim to have great difficulty in financing a defence effort that would be deemed adequate. If we have such difficulty now, when Western allied resources are much greater than those of the Soviet Bloc, how much more difficulty will we have in the

future? Faster rates of economic growth within the Soviet Bloc, combined with a demonstrated willingness on their part to devote a larger proportion of resources to strategic ends, promise to make the competition rougher for us. And there is no way to reverse the technological revolution that has made the Soviet Union a thermonuclear strategic power of the first magnitude – a revolution that, no matter what we do, has doomed the United States to a far greater insecurity than formerly. Given this grim prospect, can we afford to neglect any means of getting more defence from our limited resources? Among those means, can we neglect the advantages of an economic division of labour among allies?

II

That we cannot neglect them is strongly indicated by the magnitude of possible savings from inter-allied military specialization. Even when these savings are measured only by the comparative national costs of military supplies and manpower in implementing agreed strategy – to consider briefly the relatively small economies before turning to the possible big economies from strategic changes that is our major concern – they are not trivial. When, as one major if somewhat academic example, America, the most costly producer of ships among major maritime producers, persists in building a naval fleet bigger than the fleets of the rest of the world put together, one suspects that there is gross inefficiency in the allocation of military tasks within the alliance. Where open subsidies of about one-half of construction costs are required for our merchant marine to meet foreign competition, what are the hidden subsidies implicit in the construction of our Navy?

Or, to take another area of production, when the President of the United States speaks in his Budget Message of 'bombers that cost their weight in gold', he refers to sophisticated planes whose enormous development costs are being spread over a very small volume of production. Such small volume and consequent high cost is not typical in the United States, but would be typical elsewhere if each ally insisted upon building its own advanced planes or missiles for small forces. For such *matériel* there are enormous economies in concentrating the final expensive stages of development and production in one place in one nation. The multiplication of production sources exemplified by British production of no less than three V-bombers, each probably only a marginal improvement over our old B-47, is a contrasting case in point of dispersion. How much more sensible might it have been had we permitted the British to earn dollars by building naval ships for us, and had they spent the dollars buying improved B-47's from us! This observation is now only a lament. But why should the British now lavish money upon a Blue Streak missile because it promises to be superior to a Thor when, by the time the Blue Streak can be operational, they could buy, much more cheaply, say, a Titan or Minuteman missile from us that also is designed for underground shelters and has far greater range than the Thor?

It is easy to understand why such dependence upon foreign supply for prestige weapons, despite the great economies it promises, arouses strong patriotic opposition. But the extent to which this opposition can be supported by rational strategic reasons has declined. Dependence upon allied sources of supply is risky, but if all-out wars must now be fought quickly with existing stocks of arms, and if peripheral national wars can be fought with but small drains upon such stocks, the risk of relying upon foreign supply becomes small. It makes more sense to buy *matériel* where it is cheapest. This reasoning applies to the United States as well as to its allies. The production of many expensive items here has been defended on mobilization base and comparative vulnerability grounds, but this argument has lost its cogency as the mobilization base has been de-emphasized and America's role as the No. 1 target of enemy attack has become apparent to all.

Nonetheless the political barriers to purchasing foreign arms remain formidable. And achieving a less grossly uneconomic division of military manpower duties within the alliance, naturally, is bound to be still more difficult than for arms production. Allied forces cannot be used for military purposes that one's allies deem to be unilateral, eg, Suez, while equipment procured from abroad obviously can be. Therefore a country will not eliminate its forces, and depend totally upon the forces of others, no matter how expensive its manpower compared

to that of allies. Nor, at the other extreme, will it specialize in contributing manpower, 'blood rather than treasure', even though civilians as well as military personnel are potential casualties throughout the alliance these days. Accordingly, the opportunities for manpower specialization, for substituting inexpensive Turkish soldiers for expensive American ones, are limited. Yet the limits set by these opposed political considerations are broad. There is room for substituting troops, and the place to increase relative troop contributions is clear. The United States, the expensive supplier, has consistently maintained armed forces in about as high a proportion to available manpower as any of its allies and higher than most. Measured by economic criteria, our allies are undercontributing troops. Consequently, there is great scope for economizing by greater manpower as well as *matériel* specialization in the alliance, and therefore great reason for tackling the political problems that inhibit such specialization.

III

So much for the conventional and very restricted form of economic argument: take desired alliance military capabilities as given, and then look for cheap allied sources of supply to replace expensive domestic ones. There is nothing wrong with such an approach, and its results are important. But the really big potential economies can only be discerned by going beyond it. What military capabilities can be consolidated or eliminated within the Alliance in order to free resources to do a really good job on the urgently needed capabilities?

The outstanding example of consolidation is supplied by strategic airpower and all its corollaries – nuclear production, radar warning networks, bases protected by both active (shooting) and passive (hardening and dispersal) defences, striking forces on alert, and so on. The original concept of the balanced collective force in NATO left this capability to the United States. For our allies, this raised the problem of risky dependence upon the United States in its most acute form. But at the time did they have any realistic military alternative? And, now that they can contemplate little SAC's of their own, how costly and how little satisfactory do they promise to be? Some of the great efficiencies made possible by the old division of labour persist.

The need for one fundamental capability in NATO remains unquestioned. We require a high confidence in America's ability to destroy a large fraction of Soviet cities, if they be our targets, after a surprise thermonuclear attack directed at our airpower. This capability is variously referred to as 'the' deterrent, or as the 'passive', 'minimum', or 'finite' deterrent. None of these terms is fully satisfactory, but let us call this capability the passive deterrent. Nobody but the pacifist disputes our need for it. But there is plenty of argument about whether it should be supplemented by (1) American counterforce and associated 'active' deterrent capabilities, (2) allied passive deterrents, and (3) allied active deterrents.

The distinction between passive and active deterrents is obviously vital. The active deterrent, as the phrase implies, is the more ambitious and aggressive one. It means an ability to limit damage to us because we can destroy a significant part of enemy strategic airpower before it can be launched, to disrupt any subsequent enemy attack, and to absorb the lessened impact of any such attack. Consequently it is usually although not necessarily appraised in strategic terms that, in a strictly military sense, are more favourable to us – namely, the contingency that we strike first at the Soviets. Because the strategic initiative is ours in this contingency, what our counterforce and associated capabilities help to deter are provocations by the enemy that stop short of enemy attack directed at our deterrent force. Hence such capabilities reinforce the deterrent to peripheral aggressions that our limited war tactical capabilities provide. What a counterforce capability by itself does not deter, but in fact invites, is all-out enemy attack designed to eliminate so menacing a threat to the Soviets. Hence the greater our counterforce capability, and the more threatening our brandishing of it, the greater the weight that rests upon our passive deterrent to discourage any all-out enemy attack. A truly active deterrent does not substitute for a passive one; on the contrary, it increases the need for it.

So much for the analytic distinction. For the Alliance, the radical strategic prescription is no supplementing of the American passive deterrent

by European passive deterrents, and no supplementing by European strategic counterforce capabilities that would require strengthened complementary European passive deterrents. The resultant great savings in military expenditures in Europe can then be further increased by associated savings in air defence. The primary function of air defence measures is to make strategic retaliatory airpower secure. If there are no passive deterrent forces tied to European bases, this function need not be performed there. This does not mean no air defence at all for Europe, but it does imply that the stringent demands that would otherwise have to be met for tight all-area radar coverage and for prompt warning and identification of even small raids, can be neglected to an important degree. So the sweeping economies that result are one passive deterrent for NATO, not several; and one really tight air defence network, that of North America, not two.

This drastic proposal raises immediately the common objection of any deliberate renunciation of military capabilities, namely that people should not and will not tolerate such skimping upon direct defence. The example of air defence serves neatly to refute this objection, because even in the United States we should and do tolerate precisely such skimping. The bankruptcy of the classic philosophy that all requirements for assured security must be met is nowhere more evident than in planning for air warfare. No matter how many more billions we spend, nobody can give us 100 per cent assurance that we will never be attacked, or that we could shoot down all elements of an enemy attack before bomb delivery. How far short we fall of these unattainable goals of assured deterrence or assured 100 per cent air defence depends upon how much we spend and how wisely we spend it, but fall short we will.

Now few military experts dispute this conclusion, but many question whether it should be publicized: Will not the admission that no feasible budget can do the complete job kill the chances of getting a reasonable budget to do a reasonable job? The best counter to this question is that no procedure is better calculated to yield an unreasonable budget than an unreasonable promise. Notice what logically follows if 100 per cent assurance of deterrence of enemy attack is promised. Any measure to mitigate civilian disaster in the event of attack then involves spending money for a contingency that one has been assured isn't going to happen. So why waste money upon it? Or, if 100 per cent air defence is assured, why can't the Russians match us in this area? If so, is not our strategic deterrent negated? Why waste money on it, why not disband SAC? These are the extremes of total reliance or zero reliance upon strategic deterrence, and the absurdity of going to either of them is recognized by practically everybody. Realism in public discussion of defence deficiencies is imperative if defence planning is to be sensible.

There are advantages in facing these central defence deficiencies squarely. For one thing, we will resist spending that – for any given Soviet threat – promises merely to take us a little closer to the unreachable goal of 100 per cent air defence. We will impose a supplementary criterion that must be met: Would the proposed spending impose roughly equal or still greater spending upon the Russians if they are to offset the efficacy of our new defence measures? By rejecting measures that do not, we can prevent American air defence spending from soaring in a losing race against the Soviets.

Also, admitting that our civilians are vulnerable puts us in a better position to ask our allies to be realistic about their vulnerability. Nothing is going to make their proximity to Russia comfortable, but our being the Number One target for the Russians in the event of total war is nonetheless clear. Our European allies may retort that defence that is a matter of somebody else's intent is psychologically unacceptable. But if American air defences are concentrated primarily upon the indispensable function of protecting retaliatory forces – exploiting to the full the natural advantages of protecting military targets whose response time can be much quicker than that of civilians, which are much more mobile than cities, and whose bases can be hardened at far less cost than cities – then Americans are being defended indirectly rather than directly for the most part also. Thus our defence also rests fundamentally upon the way our actions influence somebody else's intent, in this case Russian intent. To ask that Europeans place their main trust in the same defence aggravates matters, for our resoluteness in defending them adds another matter of intent for

them to worry about. Still, defence against air attack is primarily indirect for both Americans and Europeans under our proposed division of labour for NATO.

To digress for a moment, the logic of indirect defence and the deliberate foregoing of some military capabilities are stressed here because both are so foreign to the older nominal training of military leaders. Accordingly, some resist this logic even when their own appraisal of the future drives them to planning that accords with it. Traditional military training inculcated the maxim that you should appraise enemy capability, not intent. This philosophy avoids the obvious perils of mind-reading, and is conservative. If you prepare for the worst he can do to you, you should be reasonably prepared for anything better. These are the considerable virtues in this philosophy, but they exact a price in that he who adopts it will be unable to capitalize fully upon the opportunities that arise when the enemy does less than his worst; upon the possibilities, in short, of limiting mutual loss from military moves.

This price is far too high in a world that increasingly emphasizes deterring all-out war and fighting limited wars. By definition, our deterrent power is measured by what we do to enemy intent, however difficult it is to calculate, and limited wars imply an enemy who is doing far less than his worst to us. What keeps limited wars from expanding in scope or violence is the existence of unused military capabilities that discipline behaviour because of mutual fears of enemy retaliation. Assume the worst about enemy intent, and our only rational course is to expand the war to the limit before he does. Therefore if we contemplate fighting limited wars, as we should, and if we emphasize deterring total war, as we must, we must purge our minds of the remnants of the old philosophy. As one small example, moving anti-air missiles from protecting a city to an airbase, leaving an acknowledged gap in our defences should the enemy choose to hit the city, is a difficult step for us to take. Yet it may be a perfectly sensible one, for deterrence may be strengthened and, should deterrence nonetheless fail, enemy attacks might be diverted from the city to a necessarily strengthened attack upon the better defended airbase. Our defensive move seeks both to dissuade enemy attack and influence its character should he attack anyway, and these are both matters of influencing his intent rather than his capability.

So much for our digression into military philosophy. The derived concept of cultivated neglect – to return to and complete our list of drastic reductions in desired capabilities – applies sharply to NATO's sacrosanct objective, the defence of NATO territory against invasion in any eventuality. 'In any eventuality' is the key phrase, for achieving this objective, like that of 100 per cent air defence, is then infeasible. One eventuality that must be considered is a Soviet surprise attack in Europe with nuclear weapons. Many claim that using nuclear weapons in a tactical theatre favours the defence, and favours the West because of its greater stockpiles of fissionable material. Usually these claims are encountered in the context of a fantasy wherein, finding ourselves overwhelmed by non-nuclear attack in Europe, we redress the balance decisively by initiating the use of nuclear weapons. What makes this fantasy, of course, is the assumption that the Russians will obligingly wait for us to be the first to use nuclear weapons massively despite our repeated affirmations that we will use them. Replace this assumption by the pessimistic one that the first Soviet aggressive move is a surprise nuclear attack, or modify it by assuming that we initiate the use of nuclear weapons very diffidently for humanitarian reasons or because of political pressures, and the military picture changes completely. Whatever merits there are in the dubious claims that nuclear weapons favour the defence or the West, they are overshadowed by the undisputed military advantage that accrues to the side that is the first to use them massively.

Concede this great advantage to the Soviets in the interests of conservative planning, and one generates formidable new requirements for protecting the capability to hold Europe. Old-style planning for NATO forces in Europe could naturally capitalize upon the great economies that arise from concentrated, soft, and only partly ready military forces and supply facilities – many aeroplanes to one base, not one or a few; ordinary buildings, not hardened underground installations; a few consolidated supply lines and depots, not many; one shift operation of some defence facilities rather than three, and for that matter, great reliance upon mobilizable

reserves; and so on. All this left the West vulnerable to surprise assault from the air, but tolerably so for non-nuclear warfare. Staging a great many Pearl Harbour-like assaults simultaneously was beyond enemy resources when he had no or few nuclear weapons. A resultant military build-up that discounted the possibility of a surprise attack in the theatre could be much less costly, and, incidentally, politically advantageous. Where each side could rely upon advance warning because sensible attack required extensive mobilization, the normally relaxed posture of each would be reassuring to the other.

Today these virtues can be retained only at the cost of admitting vulnerability of European forces to crippling surprise nuclear assault, which means that the burden of deterring such assault must be borne elsewhere. The alternative is to revamp NATO European forces and facilities so drastically that they could absorb a surprise nuclear attack and still be able to withstand subsequent Soviet attack on the ground. This would require that the NATO holding capability not be critically dependent upon a few hundred or so soft concentrations, for destroying so few within short order is feasible for either Soviet IRBM's or bombers. To remove such dependence is a staggering task. It is not enough that a few isolated elements survive a surprise attack; most of them must survive in order to provide co-ordinated forces and supplies that can fight a sustained campaign. This is a far more challenging assignment than protecting a few installations that might merely exact punitive damage in revenge by, say, firing a few missiles into the Eastern European satellites or beyond. And it is especially challenging because NATO installations in Western Europe are exposed to much heavier weights of attack than, for example, installations in America. A big Soviet ICBM that is converted into an IRBM can carry a far bigger warhead and deliver it more accurately, and Soviet bombers are so close that they need give little more warning than ballistic missiles.

Given this grim prospect, the renovation of NATO's European holding capability for a strike-second nuclear environment would promise, at best, to be very expensive; at worst, infeasible. For one thing, the possible savings in European air defence mentioned above are negated if tight protection must be provided for avowedly tactical forces. At one time it was commonly asserted, to be sure, that there would be compensating economies to place against the expense of revamping NATO European facilities. The substitution of nuclear weapons for forces was supposed to provide budgetary offsets. But it should always have been clear that the substitution process would permit only relative savings in forces – that it would merely keep force requirements for nuclear war from soaring as much as they otherwise would in answer to a vastly growing enemy threat as he too acquired nuclear weapons for theatre employment. Our military leaders have consistently pointed out that force requirements for bilateral nuclear war would probably be increased as much or more by the expectation of greater casualties from enemy weapons as they would be decreased by the substitution effect of our own weapons.

The prospect of renovating NATO's holding capability in this way is thus probably made sufficiently unattractive for Europeans by its expense alone. If not, its politico-military disadvantages compared to other expensive military alternatives will make it so. These disadvantages can be perceived by considering the damage implications of such a renovation. For deterrence the replacement of soft and obviously vulnerable concentrations is obviously most desirable if it achieves invulnerability. It is still very desirable if it merely creates serious doubt in the enemy's mind about vulnerability, or drives him to greater expense to counter our vulnerability-reducing measures than we need invest in them. But some vulnerability-reducing measures may do only the last or none of these things. For example, consider hardening a soft point target in Europe fifty-fold. This would constitute a tremendous change, driving the enemy to perhaps a thousand-fold increase in bomb yield and from air to ground-burst weapons if he is to retain the same high confidence of destroying the target with one weapon. Yet to do so may be possible for him only by changing his bomb, not his delivery system, which does not cost him much.[1] What

[1] The illustrative calculation is as follows: the soft target is assumed to be vulnerable to two pounds per square inch overpressures (2 p.s.i.), the bombing accuracy is measured in terms of a probability of one-half that bombs will fall one-half mile from the target or closer (C.E.P. = 2,500 feet), and the required yield for an air burst weapon to achieve a 90 per cent probability of kill is then only two kilotons. Increase the hardness of the target fifty-fold (100 p.s.i.), leave the bombing accuracy and desired probability of kill the same, and the required yield becomes two megatons for a ground burst weapon.

does change enormously is the incidental damage to the countryside should he attack. In a similar way, protecting the soft target by making it mobile may lead to the same incidental result. Given the enormous area over which thermonuclear weapons spread low overpressures that suffice for soft targets, one promising tactic for the enemy is to compensate for uncertainty about the precise location of a target by blanketing the suspected area with big weapons. And his obvious counter to simple dispersal of targets is to multiply the number of weapons.

These considerations do not in the least mean that all vulnerability-reducing measures in Europe are of dubious or even negative utility. But they do point to one dominant conclusion: If such measures are taken only to secure NATO's ground holding capability, they are likely to achieve it only at the cost of making this capability academic. The main objective of a holding capability, after all, is to protect Europe if deterrence fails. To seek to protect by measures that all but ensure total war devastation in Europe makes nonsense of this objective. The old slogan that summed up European demands for an ambitious 'forward strategy' that would preclude enemy occupation even if deterrence failed was, 'There would be no point in liberating a corpse'. Today the grim addition must be that there would be no point in defending a Europe already made a corpse by initial Soviet air attack.

Europeans can only be interested in deterring such a catastrophe. Merely driving the enemy to a much greater weight of initial attack by your protective measures will, it must be admitted, strengthen deterrence. Optimistically, the greater weight required will drive the enemy to a bigger and more complicated attack that jeopardizes surprise, and this prospect may deter him. Pessimistically, it will give him pause, not because it poses serious operational difficulties, but because he shrinks from the vastly increased level of violence with its attendant chances of provoking the most extreme retaliatory action throughout NATO. These are important if inadequate deterrent effects. Yet, cannot like deterrence be more cheaply achieved in other ways, and at no greater cost in terms of making devastation greater should nuclear war come? Specifically, for a European country, the securing of a comparably protected strategic retaliatory force promises to achieve these 'threshold damage' deterrent effects plus, perhaps, an enhanced threat of direct retaliation against the Soviet Union itself. And the formidable job of protecting such a force is still less severe than protecting a ground holding capability, for surviving elements need be neither as many nor as well-co-ordinated – some strategic missiles surviving at random may pose a significant threat to the Soviets.

All this certainly does not mean that a passive strategic deterrent of its own is desirable for a European country. But if such a deterrent force is rejected as infeasibly expensive, or, in view of SAC's presence, as unnecessarily expensive, how much more so must a true revamping of NATO's tactical capability appear! The one bad alternative dominates a worse one. The protection problem for a real, strike-second, nuclear tactical capability is more demanding, its fulfilment tends to ensure total war devastation in Europe in the event of war rather than protection, and its deterrent effects are less than those offered by alternative preparations. So if Europeans can be persuaded to forego strategic deterrent forces of their own in the interests of efficient collective defence, with all the savings in Europe in terms both of air offence and defence that this implies, they should surely be reluctant to undertake the sweeping reconstruction of NATO's European facilities that would be required to implement the 'forward strategy' of holding on the ground despite initial massive Soviet nuclear assault. Holding to this most traditional of NATO objectives for so dire a contingency is simply unrealistic.

IV

Our total list of economies is imposing, making it possible to do a really good job elsewhere in NATO in supplying other needed military capabilities. So far our 'package' for NATO has assumed only one indispensable capability: an extremely well protected and strong American passive deterrent. That this capability is not enough has been so repeatedly and ably argued by the proponents of limited war that it is necessary to summarize only their two main themes here. First, even where the threat of massive retaliation is credible, it cannot deter

all aggressions and provocations that call for the use of force. It cannot deter them because they may arise by accident, miscalculation, or, more fundamentally, because the sources of conflict are inherently so ambiguous that there is often little possibility of differentiating clearly between aggressor and defender. Therefore, the threat of massive retaliation cannot reduce the probability of provocation to near-zero, and the widespread use of the threat will mean that we must either implement it at the cost of total war, or else back down repeatedly with a subsequent discounting of the threat as a bluff. Second, the credibility of massive retaliation is brought into question at the outset anyway because of the manifest disparity between the use of maximum force and the minor and unclear nature of the provocations that are supposed to invoke it, and its credibility is undermined further when its implementation would imply near suicidal results. Suppose we had only a small force of protected ballistic missiles as a minimal passive deterrent. It might be limited enough in capability so that all it could do at best would be to destroy most Soviet cities. If so, its full use would give the Soviets a maximum incentive to exact the most dire revenge together with a minimal interference with their ability to exact it. Using such a force, in short, would be nearly equivalent to suicide, and confining our strategic airpower to it would further impair the credibility of massive retaliation.

These two main themes of the limited warriors suggest not only that a minimal American passive deterrent is not enough; they point to the two directions in which it should be supplemented. A limited war capability is vitally needed to meet local provocations. To avoid being overwhelmed in local theatres by massive enemy use of nuclear weapons, however, a limited war capability must be backed by a threat of strategic retaliation that is made credible enough to deter such enemy action. Its credibility is enhanced, first and foremost, because enemy mass use of nuclear weapons in local conflicts would constitute a major provocation that is clear-cut and under enemy control. The credibility of massive retaliation in response to such enemy action is further enhanced to the extent that our strategic counterforce and air defence capabilities promise to limit damage to us if we do retaliate. If we want to deter aggression in Europe and elsewhere, as we do, but concede that our tactical limited war capabilities can be overwhelmed by nuclear assault, as we must, then we are driven to some continuing reliance upon retaliation by strategic airpower.[1] An American active as well as passive deterrent strengthens the credibility of this ultimate reliance.

How much and what kind of a limited war capability, and of an active deterrent, are the open issues. Some strategists propose essentially no active deterrent back-up for a limited war capability. They overlook the need for it or advocate the substitute of multiple passive deterrent forces under the control of our allies. In either case they properly stress the great cost, in strategic as well as money terms, of an ambitious American active deterrent. The strategic cost, which we have alluded to earlier, is twofold. First, the more aggressively we pursue an active deterrent policy, the more we reduce the attractiveness to the Soviets of all those alternatives that lie between the extreme policies of not provoking us at all and of hitting SAC directly. Clearly, we welcome this sharpening of alternatives for them insofar as it greatly enhances the probability that they choose not to provoke us, but even a small increase in the probability that, denied the intermediate alternatives, they strike directly at us, is a huge price to pay. Second, Soviet apprehensions that we plan to strike first at them may be increased because our preparations are consistent with that aim, and the likelihood that they will strike the first 'pre-emptive' blow at us may consequently increase. If each side achieves an ambitious active deterrent capability, the difference in damage to one's own country between striking first and striking second will be widened, giving greater objective grounds for strike-first strategies. Consequently, the

[1] Strategic retaliation need not be massive. It can be limited, eg, hit one city in the enemy homeland a week until he gets out of Country A. Whether it should be limited is a different matter. When, as now, it is much better to strike massively first than to strike second, and when one's attempt to hit first less than massively is apt to trigger massive retaliation, a limited strategic strike might be simply the worst way to start World War III. Later, if and when strike-second strategic capabilities approach or even surpass the power of strike-first blows – ie, each side finds no soft spots to disrupt in the enemy's entire system of retaliation and must use up, say, two missiles to destroy one on the other side – the practice of limited retaliation would become less undesirable. There remains the problem that such a practice removes the traditional (Korean) limitations both of weaponry and geographic sanctuary, and so invites a chain of retaliation and counter-retaliation that has no natural limit and culminates in – what? Neither the bizarreness nor the current undesirability of a strategy of limited strategic retaliation should stop inquiry into this or any other strategy for bolstering our vulnerable tactical capabilities.

vicious spiral of interacting expectations – 'Perhaps we'd better strike because he is likely to strike first because he fears that we are going to strike because . . . and so on' – will be intensified. The strengthened objective grounds for strike-first strategies reinforce the subjective ones of mutual fear and suspicion that are bound to be present anyway. It is this spectre, above all, that leads some to argue that we should not participate in the most fearful of arms race, but forego an active deterrent capability.

Their case is reinforced by the prospect of great expenditures for a thorough-going active deterrent. The counterforce component is bound to be expensive because it demands large numbers of delivered weapons, and hence vehicles, to cover many enemy launching sites. The vehicles it demands may have to be sophisticated and costly to ensure accurate delivery of heavy pay-loads, and extensive reconnaissance may be required as well. So an SAC that pursues an ambitious counterforce capability will be expensive. Yet it is but one component of an active deterrent policy. Few would claim that it could do so thorough a job in even the best of military circumstances that not even a few Soviet missiles would be launched, and it only takes a few to destroy a few cities unless our defences can prevent it. Much of our population could be destroyed by even a small surviving fraction of surviving Soviet forces if our cities were defended no better than they are today, with no anti-missile defences and but little civil defence preparations. A thorough-going active deterrent requires ambitious complementary defence measures for cities – active (shooting) and passive (shelters and evacuation) – if its underlying objective of limiting damage to us is not to be negated. And the more we rely upon our strategic airpower rather than other military capabilities to deter provocations that stop short of direct assault upon the United States, the greater the need for these expensive complementary measures.

These expenses of a policy that, moreover, risk upsetting the bilateral strategic equilibrium, must give anyone serious pause in advocating an active American deterrent. Certainly they counsel moderation in aspiration and advocacy, and a ready recognition that such a capability must not be the whole of our military power. But to forego an active deterrent altogether is another matter. As a comparatively minor issue, the arguments of great strategic and money cost are not completely consistent with each other. If we seek an active deterrent that promises to be extremely expensive because the enemy protects his vehicles so well that many of our vehicles would be required to destroy one of his, because our knowledge about his protective measures and the location of his launching sites is very limited, and because our defences promise to be fairly ineffective, then his fears that we might be tempted to strike first should not be increased very much. To put it the other way around, the strategic equilibrium is likely to be made extremely unstable only when an effective counterforce capability promises to be so cheap as to be readily within the grasp of either side. The expensiveness of an active deterrent policy or its limited effectiveness for any given budget, are simply opposite sides of the same coin. Limited effectiveness here, otherwise deplorable, offers at least the consolation of aggravating only moderately the temptation for him to strike first. Of course he can never be confident that we aren't confident about our capability to limit damage to ourselves if we do strike, and so on in the subjective game of interacting apprehensions that is central to mutual deterrence. But an American active deterrent need not purchase the necessary back-up for our limited war capabilities at too great a strategic cost in terms of increasing the probability that the Russians strike directly at us.

Nor need the money cost be enormous. The provision of an adequate passive deterrent, essential in any case, will go far towards meeting the demands of an active one. In the first place, the vehicles can serve dual purposes. Ballistic missiles, for example, are relegated by some strategists to city attacks because they are deemed too inaccurate and their warheads too small for counterforce attacks. But they can play a vital role in counterforce attacks also because, at the very least, their speed enables them to disrupt and pin down enemy forces before slower bombers can reach those forces. More generally, some of our vehicles can and should have a counterforce capability for the case when we strike second, which automatically provides

more of this capability in the militarily favourable strike-first situation. Those who find no utility in trying to hit enemy forces when we strike second must ponder about how we propose to end a war on terms as favourable to us as possible. Terminating a war when both sides retain some residual striking power, but in which each has suffered great force losses by enemy attack as well as by attrition in one's own attack, is a much more favourable proposition for us than when it is only our forces that have been dissipated and destroyed. If, moreover, our retaliatory power has been expended upon his cities, leaving no enemy cities as continuing hostages, our bargaining power will be essentially zero. In terms of whatever control remains relevant, the world is his. Some retaliatory counterforce capability is highly desirable if only to avoid this worst of all contingencies.

Thus in terms of type of vehicles and related capabilities, an adequate passive deterrent will yield some counterforce capability as a by-product. There remain the questions of its size and of both the nature and size of complementary air defence measures. These are open questions that require quantitative specifications of alternative mixes of capabilities that go far beyond the scope of this paper. Yet a few remarks may help to establish a sense of proportion. Many now speak of a vast 'overkill' potential of our strategic forces, and imply that our passive deterrent can be made smaller. Sometimes, however, their calculations of 'overkill' are pertinent only to the absurdly academic situation where the enemy has obligingly interfered not at all with the process of converting our kill potential to actuality. Realistic calculations must allow for sizeable force losses before we deliver our weapons, and our retaliatory forces must be big enough to absorb the losses that cannot be avoided by protective measures that would be cheaper than expanded forces. Furthermore, the blows that our surviving forces can inflict must grimly promise to be heavy enough to counter enemy passive as well as active defences. When one has allowed for these factors, the illusion disappears of deterrence on the cheap because only a few small missiles need match a few large enemy cities. Somewhat similarly, one comes to suspect air defence on the cheap because it concentrates solely – rather than primarily, as we advocate – upon indirect defence via protecting our deterrent forces rather than direct defence of civilians. Nobody can guarantee deterrence even when our defensive measures strengthen its prospects; and elementary prudence suggests that we insure against its failure by measures that will mitigate disaster. So a full-fledged passive deterrent may go far towards providing an active deterrent by-product capability in terms of type of force, size, and complementary air defences. But perforce, to repeat, we leave open the question – How far?

Our argument has conceded the strategic and economic costs of an active deterrent, but countered the claims that exaggerate them. These costs cannot be eliminated without impairing the credibility of the retaliatory threat that backs our limited war capabilities. But they can be held to reasonable levels if our goals for limiting damage to the United States are realistically modest and, the big if, the Soviets do not push us into an intensified strategic arms race. Whether they will do so, or alternatively permit a slackening in the race, will be very hard to determine in the event, let alone to predict. Only exceedingly comprehensive inspection schemes could furnish assurance on this score, and such schemes are, to say the least, unlikely. Still, there is one important, if inconclusive, indicator that should be apparent. Suppose the Soviets began a much intensified civil defence programme, one whose design appears tailored to limit damage to tolerable proportions in the event that they strike first. Their efforts to remove their population from hostage status could hardly pass unnoticed. Since we cannot count on their not doing so, our research and development efforts in civil defence should be thorough-going. Otherwise the long lead-times involved in a crash programme might preclude our competing technologically in a civil defence race. But because we can hope that they will not initiate such a race, perhaps we ought not to precipitate it. In this case, our expenditures on the civil defence and other components of our active deterrent, while increasing, need not soar as they so obviously could.

In sum, an admittedly incomplete but still potent American active deterrent need not be prohibitively expensive. And its strategic cost in

terms of the risk of inciting rather than deterring an all-out attack upon America can be held low. If we combine obviously modest expectations of limiting damage to us as the goal of an active deterrent policy, even if we do strike first; great emphasis upon protecting our strategic forces as, in any case, the *sine qua non* of our passive deterrent; and a limited war capability adequate to meet assaults that fall short of massive nuclear attacks in overseas theatres – all these lower the strategic cost to the tolerable minimum that is consistent with a credible massive retaliation threat to buttress our vulnerable limited war forces. A modest active deterrent goal will be unlikely to incite the Russians much; a well-protected retaliatory threat should discourage them from attack even though they are incited to some extent; and a limited war capability will permit lesser threats to be met without invoking the threat of massive retaliation, and therefore will lessen the mutually reinforcing apprehensions of surprise massive attack on both sides.

V

We are left with the questions of the kind and amount of a limited war capability in Europe. We propose that the European theatre capability should be designed both in structure and deployment primarily for non-nuclear warfare, with nuclear capabilities relegated to a secondary status, rather than the other way around; and the forces should be big enough to hold without using nuclear weapons against even massive non-nuclear Soviet assault. This prescription is a retreat to old orthodoxy in both respects. The new orthodoxy, which arose out of despair that the NATO nations would make adequate force contributions, sought to rationalize smaller forces by designing them primarily for nuclear warfare. But, as we have seen, this course is tremendously expensive if the design is for bilateral nuclear warfare in which we are prepared to strike second, and anyway bilateral nuclear warfare makes a mockery of the underlying objective of protecting Europe.

Our proposal, otherwise expensive in terms of size of forces, economizes in two major respects. It foregoes as futile a renovation of NATO Shield forces for a true strike-second nuclear capability, and it minimizes the additions of forces to the Shield because they are appropriately tailored to non-nuclear holding action. With nuclear tactical capabilities relegated to secondary status, it does not make sense, for example, to provide those guided surface-to-surface missiles that are so expensive and inaccurate that they are absurdly inefficient for non-nuclear warfare. It does make sense, however, to add auxiliary bomb racks to dual-purpose aeroplanes for nuclear weapons, and to provide other nuclear delivery capabilities that can be inexpensive adjuncts. The nuclear capabilities would be useful either for strike-first purposes of for retaliating against enemy nuclear blows in the theatre that, for political reasons, would be so limited as not to preclude such response.

Even with these economies, the prospect of force goals reminiscent of, if by no means precisely equivalent to, the never-achieved Lisbon goals of 1952, will strike many as futilely ambitious. One can only reply that strategically acceptable alternatives are unlikely to be any cheaper. Our economies can be extended, for example, by postulating for any fighting in Europe a code of weapon limitations that is slanted greatly in our favour: 'The critical determinant of the size of the NATO shield, then, is this capability – a defensive force which, using tactical nuclear weapons to the extent necessary, could clearly break up and defeat a maximum Soviet *non-nuclear* attack.'[1] Given this criterion, our military planners are free to substitute nuclear weapons for troops to the extent that comparative costs indicate – and that is likely to be a great extent. Accordingly, only small forces will be needed, and they will tend to be designed for the unilateral nuclear warfare that so markedly favours the side that indulges in this fantasy. Some military planners and most finance ministers will welcome such a proposal for obvious reasons. Strategists should not, for why should the Soviets acquiesce in so palpably one-sided a weapon limitation? Why, indeed, should they not counter with proposals for asymmetric limitations that are comparably biased for them? Are Russia's strategic bargain-

[1] Lincoln Gordon, 'NATO in the Nuclear Age', *The Yale Review*, 1959, reprinted *Survival*, May–June, 1959. Italics added. The crucial point of difference with Gordon's analysis is identified here. There is much else that is admirable, notably his insistence upon the continued need for strength in Europe that is, moreover, firmly rooted in trans-Atlantic rather than merely European interdependence.

ing power, ruthlessness, and vital interest in the European theatre any the less than ours? And if both sides propose such limitations, which are incompatible, either non-nuclear force however provoked will be met with non-nuclear force; one side will be shown to be bluffing; or, if the threats are credible, the first use of tactical nuclear weapons by either side will trigger general war. If we pin our hopes upon non-use of nuclear weapons as the most definable of weapon limitations, and one that is roughly symmetrical in advantage, we must be able to respond in kind to combat that observes this limitation. The resultant force estimates for the NATO Shield will not be small.

An adequately big and primarily non-nuclear Shield is not beyond our means, especially if we economize in other military areas as suggested above. NATO, after all, has greater production and even greater manpower than the European Soviet bloc, and the satellites may even contribute negatively to the Soviets. Our greater potential is especially important for the non-nuclear warfare that may permit some reserve forces and other resources to be mobilized in time. And, beyond the arguments of our greater potential, preparation for such warfare capitalizes upon most of our existing military assets. The conventional criticism of the time-phasing of our past NATO preparation – that it was World War II-oriented and so ill-designed for the future – is perhaps well founded in its appraisal of our foresight, but nonetheless beside the point. However accidentally inspired, a largely conventional military preparation very roughly fits modern non-nuclear limited war aspirations. In contrast, had NATO European forces been designed from the outset for bilateral nuclear warfare, we would have chased the will-of-the-wisp of invulnerability to the still greater neglect of non-nuclear limited war capabilities. Perhaps we should be grateful for some lack of foresight. In any case, it is surely sensible to model our current strategic pretensions to conform in the main to the assets that we have, whether these assets were well or ill-planned.[1]

[1] Our broad and sketchy argument here necessarily avoids specifics, and hence omits vital examples where our preparations have seriously compromised our non-nuclear capabilities. These are likely to become more grievous unless the unorthodoxies advocated here become accepted. On the current dominance of nuclear over non-nuclear war planning, and for an amplification of other points in this section, see my article, 'The Place of Limited War in NATO Strategy', *NATO and American Security* (Princeton and Oxford University Presses).

The economic feasibility of such a limited war capability is enhanced because we can settle for considerably less than meeting the Russians division for division. The prepared defence has some advantage over the offence in non-nuclear war, and this numerical advantage may be considerably reinforced if we devote sufficient ingenuity and effort to devising novel means of non-nuclear defence. The guided missile, for example, is commonly associated with nuclear warheads. But small guided missiles, even with conventional warheads, can still have revolutionary impact upon the battlefield. Specifically, the anti-tank and anti-aircraft missiles hit at precisely the offensive vehicles that overwhelmed World War II prepared defences. Can these not be exploited to favour the defence, especially in a non-nuclear environment where the chance is greatly increased of the defensive battalions surviving to fire? Much more generally, can renewed vigorous research and development directed towards the neglected area of non-nuclear defence contribute other such examples? And, if we counter current apathy by providing a *rationale* for such defence as the relevant contemporary purpose of the NATO Shield, may we not hope to stimulate such research, especially in the European scientific community now least tapped by the Western defence effort? As the question marks suggest, all these are but possibilities, but they are not possibilities that we can afford to neglect.

Once again our proposal can be summarized in terms of competing military philosophies. It rejects the extreme view that we must prepare only for the worst contingency, that of general war. On the other hand, it rejects the vacuous view that we must somehow be equally prepared for all military contingencies, which if it means anything in practice, usually means that we are to be comparably ill-prepared for any contingency. We must compromise among preparations for nuclear tactical war and for non-nuclear, but we propose that the compromise be weighted heavily towards the latter in order that this capability be strong. Given this tactical capability to handle even large non-nuclear conflicts, nuclear retaliation can be reserved for

It may well be objected that a NATO Shield designed primarily for non-nuclear war will be able to contribute less in the event of general war. To this I reply that the general war contribution of European NATO forces promises to be small anyway: 'NATO: Deterrent or Shield?' *Foreign Affairs* (January, 1958).

the comparatively clear-cut case of enemy nuclear assault. And for massive enemy nuclear attack, this retaliatory threat would be posed by the strategic forces that can promise to implement it effectively rather than by European-based tactical forces.

VI

These, then, are the great diseconomies of our proposal: a big Shield for Europe, and a continued reliance to a degree upon an American active deterrent. Against these must be placed the great economies made possible by concentrating NATO strategic airpower and attendant enhanced air defences primarily in North America, and by abandoning any renovation of European tactical capabilities so sweeping that it seeks the ability to hold even after large enemy nuclear assault. On balance the proposal is at least as economically realistic as any of its competitors, save, of course, for those that deny the need for military strength or cling to illusions that our nuclear monopoly can be re-created by fiat.

Whether our proposals are politically realistic is a different and open question. They rest fundamentally upon an appraisal that now, since Soviet military power has grown so formidable, we can afford less than ever to forego the efficiencies of a truly collective defence. Yet collective defence acknowledges mutual dependence, especially of Europeans upon the United States, to which there is obvious great resistance. And the craving for equality of status in the alliance – understandable especially for those like France where tradition feeds the craving even though geography, resources, and capacity for sacrifice do not – generates a *mystique* about sharing modern weapons that wars against our proposals. The current trend is towards both a primarily nuclear Shield for NATO and independent strategic retaliatory forces. We might get the worst of all worlds. At the cost of gravely impairing our non-nuclear combat capability, great resources might be diverted towards a strike-second tactical nuclear capability that nonetheless doesn't get protected enough, and to European strategic forces. These strategic forces might well be inefficient in retaliation because they are so vulnerably exposed to near-by Soviet attack; of still more dubious credibility in pre-emptive attack than SAC, because their use would be near-suicidal given comparative smallness of forces and weakness of complementary air defences; and of questionable net deterrent value because their presence weakens the presumption that the big American deterrent would be invoked in European defence.

Even given current trends, the picture need not, of course, be this black. The real dilemma is whether unstinting advocacy that runs counter to current trends will aid or hinder attempts that are content to ameliorate them. Is it better for us to help Europeans get good nuclear systems than to hinder their getting any; to settle for the second-best policy alternative in order to avoid a still worse one? For this perennial political question there can, as usual, be no confident answer. If they are certain to seek nuclear systems, simple economic prudence suggests that we help them rather than have them painfully retrace the steps of our early developments. But how can we be certain when declarations of intent are used as bargaining counters to compel our help, and when the implications of a wider distribution of nuclear capabilities are so fateful for attempts to halt atomic tests and limit the spread of such weapons? We cannot be certain, and therefore the issues raised by our discussion are still pertinent. In strategic assets, the old infrastructure and even most of the required ground forces are here if we but capitalize upon them. In strategic concepts, more and more Europeans are perceiving the blind alleys into which nuclear preoccupation has led us. Perhaps it is not yet too late to settle for some modified variant of our proposed alternative.

NATO as the Fourth Atomic Power

(*continued from page 107*)

capability – although such action might very well remove a good part of the motivation of others to do so. Our present strategy, influenced as it must be by the hopes and the needs of fifteen nations, is inevitably one of compromise. This has certainly given us a useful start. But for the Alliance to have continuing life and meaning, it needs an increasing authority. Action to pass to the Alliance greater control over atomic weapons and subjecting their use more directly to the collective will, if politically feasible, could be a great new step.

NATO as the Fourth Atomic Power

GENERAL NORSTAD

at Pasadena, December 6, 1959

The tentative suggestion put forward by the Supreme Commander, Europe, of ways and means by which the spread of individual nuclear powers in NATO might be halted by the creation of an atomic authority in NATO, has attracted a great deal of comment and misinterpretation. His only expanded public statement on the subject is therefore re-printed here.

NATO POLICIES are supported principally by two elements; manpower and weapon power. I use the word manpower in the broad sense; I mean the power of men to lead and to think and to decide, as well as their physical strength measured in battalions, air squadrons or fighting ships.

The effectiveness of the new weapon systems depends to a very considerable extent on their atomic components. This fact of life was recognized by the heads of the NATO governments two years ago this month, when they announced that they had 'decided to establish stocks of nuclear warheads, which will readily be available for the defence of the Alliance in time of need'. This stockpiling process – which is really only a system of supply – has gone steadily forward and it should, quite soon, meet the technical requirements for weapons throughout the Alliance. The system, as it now operates, does not involve a wider dispersal of the actual control of warheads or other nuclear components. It has not created further national atomic authorities. But it has had the highly desirable effect of broadening the European participation in the nuclear deterrent, and of intensifying the power of the Shield force itself.

While the strictly military requirements of the Alliance are thus being met, certain problems have developed among the member countries concerning the control and distribution of nuclear weapons. Some NATO countries have interests that lie outside the Alliance and they feel that they have additional and special needs of their own. It is no secret, for instance, that France has long desired and indeed may be moving towards an independent atomic capability. On the other hand, some other NATO countries, far from desiring such a position for themselves, have expressed the greatest concern at the prospect of the emergence of new independent atomic capacities, at the rise of a fourth, possibly a fifth or even a sixth atomic power.

So a new question has risen among us. How do we meet a growing, but still somewhat confused and conflicting desire among our European Allies for a broader sharing in the control of nuclear weapons? How can the Alliance as a whole be assured that such weapons will be available to them in all reasonable circumstances for their defence, the defence of Europe?

Personally, I feel that this question needs to be carefully considered by the Alliance. The forces which are assigned to the NATO mission are after all largely organized around nuclear weapons: the defence of Europe against a serious attack depends on these weapons. A search for a fair solution to the problem of sharing and control is thus of vital concern to all of us. It is obvious that I, as a military leader, am in no position to propose a solution to what is overwhelmingly a political problem. Further, there is the fact of the United States' law which limits the distribution of weapons. Many ideas have been advanced for dealing with this question. It has been suggested, for instance, that the control of weapons might be passed to the Alliance, and that they might be committed to NATO so long as the Alliance endures.

Even this idea might not meet the varied and sometimes conflicting requirements of all the countries concerned. I know it would not.

It should not be assumed that even the creation of a multi-national atomic authority – making an alliance, NATO for instance, the fourth atomic power – would necessarily influence the desire of some nations to pursue their own independent quest for an atomic weapons

(continued at foot of page 106)

Shield Forces for NATO

B. H. LIDDELL HART

From The Guardian
February 16 and 17, 1960

In this important article one of the foremost military analysts in the world applies his researches into the ratio of force to space to the question of how large a NATO force is necessary for the defence of the Central Area.
(By permission of *The Guardian*)

HOW MANY divisions does NATO need in order to maintain an effective defence in Germany? On the Eastern Front in the Second World War the Germans often defeated set-piece offensives on sectors where the Russians had concentrated a seven to one superiority of force. On the other hand, the Russians usually succeeded in finding penetrable stretches somewhere on the front when their over-all superiority had risen to about three to one.

With the NATO forces it would be unwise to reckon that they could hold their own with as low a ratio as that on which the Germans managed to do so – in view of the NATO mixture of nationalities, different training systems, and other handicaps. But if their forces had a ratio of two to three that should be a safe insurance against a sudden attack, provided that they attain adequate mobility and flexibility. At present they are not adequate in these essential qualities, and this deficiency is more important than lack of numbers.

To have any real chance of repelling a sudden high-speed attack the 'Shield Force' must be composed of fully mobile divisions, always ready for immediate action and highly trained. It is folly to imagine that it would be possible with forces of short-term service, even if their numbers were doubled or trebled. The need cannot be fulfilled unless the 'Shield Force' is composed of professional troops or long-term conscripts – two years' service would be the minimum for the purpose.

The Soviet forces in Eastern Germany comprise twenty mobile divisions. So a NATO strength of about thirteen ready-for-action Regular divisions should be able to check a sudden attack by this force – without resorting to atomic weapons and without yielding ground. It would be better able to check such an attack than the present NATO shield force of twenty-one divisions, which is handicapped by its large proportion of short-service conscripts.

Intelligence experts reckon that the Soviet forces might possibly be raised to forty divisions within about ten days, although it would not be easy to bring up such a large reinforcement without being detected, and thus giving NATO warning and time for counter-measures. But even if the Soviet striking force was thus doubled, a NATO force of twenty-six Regular divisions should suffice to keep it in check; or alternatively, twenty Regular divisions and a German citizen militia equivalent to ten divisions, organized and trained for static or locally mobile defence.

Such a combination would be a much better shield than the thirty present-type divisions of short-service conscripts mixed with Regulars, that the existing NATO plan aims to achieve. It could be more immediately ready for action, more efficient in performance, and more truly economic.

If any surprise attack was promptly checked, it is unlikely that the incursion would be continued. For its chance of success in producing a *fait accompli* would have vanished, while persistence in it would hour by hour increase the risk of detonating a nuclear war – which would nullify the aggressor's object. Moreover, according to authoritative estimates, the maximum strength to which the Soviet force on this front could be built up logistically even after a month is sixty divisions. In defence, a NATO force of forty divisions should suffice to keep that number in check and without the use of atomic weapons. Such a strength can be attained within a month of mobilization even under present NATO arrangements.

So there is a good insurance against the most unlikely contingency of a massive invasion if the

training and organization of the NATO force matches that of its opponents. The basic requirement is an improvement of quality rather than an increase of quantity.

Force and space

It may be argued that a Shield Force on a two to three ratio, although a good insurance in relation to the Russian forces on the NATO central front, would not be adequate in relation to space – because of the width of that front. So a fuller examination of this aspect of the problem may help to clarify the issue. In such an examination there are two key questions – what is the tactical minimum of troops necessary to cover and control a given space, and what is the strategical minimum?

The first question turns on a calculation of the extent of space that troops armed with modern weapons, other than nuclear ones, can cover with a closely interwoven network of fire. In examination it soon becomes evident that the ratio of troops to frontage customary in recent wars, and in conventional military doctrine, does not correspond to the ratio of development in weapons during the last hundred years and in their capacity to cover an area with a sustained downpour of fire.

Nearly a century ago, in the later stages of the American Civil War, Lee's army kept Grant's greatly superior numbers in check for many months – until its strength fell below 1,500 men to the mile. More than half a century ago the Boers repeatedly succeeded in repelling attacks – by British forces which vastly outnumbered them – with a strength of only 600 to 800 men to the mile. Weapons have developed so immensely since then in range and power that it is hard to see a reason why the tactical minimum considered necessary, and customary in practice, has not been adjusted proportionately.

Is there any reason, other than custom fostered by caution? The surmize that this is the real explanation tends to be confirmed by examination of the operations in both the First and Second World Wars. For it is evident that attacks were often checked by small detachments or remnants that were heavily outnumbered – whereas attacks succeeded in many cases where the defenders were far more numerous relatively to the frontage. The contrast suggests that a build-up of the defence, to the level suggested by custom and caution, often aided the attacker by presenting him with a much increased target – easier for him to destroy by concentrated fire.

There is abundant evidence from the last war to show that German divisions of depleted strength often successfully defended frontages of 20–25 miles (30–40 kilometres). There are also some notable examples on the Allied side of similar performance. So it is reasonable to consider a frontage of 25 miles (40 kilometres) as within the defensive capacity of a fully mobile divison of present strength – as is now coming to be recognized in high military quarters. Taking account of the corps and army troops available to support a division, it represents a basic scale of about a thousand men to the mile (600 men to the kilometre).

That scale is not much less than what proved adequate for effective defence in the later stages of the American Civil War, and more than the scale with which the Boers maintained their defence nearly sixty years ago. Thus it might be further reducible after a more thorough scientific analysis of recent war experience and weapon capabilities. Such a reinvestigation is very desirable. For a reduction of the *tactical minimum* considered necessary to provide an effective curtain of fire and 'control a given space' would reduce the problem of providing the *strategical minimum* – especially in mobile reserves – to maintain a forward defence of the NATO front as a whole.

But for the time being it is safer to take a scale of one mobile division for 25 miles (40 kilometres) of front as the tactical minimum. On that basis ten such divisions would be needed to cover the front, between the Baltic and Bohemian mountains, embracing the Thuringian mountains, that is threatened by the Russian forces poised in East Germany. Beyond this number adequate mobile reserves should be available to counterbalance the attacker's power – and inherent advantage – of concentrating his effort along a particular line of thrust.

Views about the strategical minimum of forces required for effective defence still tend to reflect the habit of thought that developed in the First World War, and its doctrinal legacy. The continuous trench-front that came to be established in 1914 on the Western Front, and

persisted throughout the war, left a lasting impression. It was deepened by the low mobility of forces at that time. Ever since there has been a tendency to assume that the whole strength of a frontier ought to be provided with the tactical minimum for effective defence of every sector, both in forward troops and in local reserves for their support. Thus the strategical minimum requirement has come to be regarded as basically no different from the tactical minimum. It is a view which amounts to visualizing the extreme case, extremely improbable, of having to meet a heavy attack on all sectors simultaneously – and demanding forces strong enough for defence everywhere. Its influence is apparent in suggestions and arguments that, without the use of nuclear weapons, NATO would need a standing force of as much as seventy divisions on its central front, even against Russian forces of lower strength.

Such a view is contrary to the facts and lessons of war experience. In all wars previous to this century the forces engaged were very small in proportion to the front as a whole – much smaller than they became in the last two wars, although denser on the battlefield. In the wars of the eighteenth and early nineteenth centuries a battlefield strength of 20,000 men to the mile was normal, yet countries were successfully defended with a ratio of merely 250 men to the mile, or less, on the front as a whole – a strategical ratio of forces to space that was barely more than 1 per cent of the tactical ratio.

The capability of covering a wide front with such relatively small forces, while bringing sufficient tactical strength into action against the enemy's strategic line of advance and concentration, came from the ability to make a good appreciation of the enemy's likely routes of advance and objectives, so that adequate forces could be moved thither to bar his path.

It is hard to see any good reason why this should be considered impossible now. The means of information, of intercommunication, and of movement are much better than in the past – and on balance they favour the defending side, increasing its chances of countering the attacker's initial advantage in surprise.

On NATO's central front it should not be too difficult to gauge an attacker's likely objectives and routes of advance. Although that front is 440 miles (700 kilometres) in extent, only the more northerly stretch of some 250 miles (400 kilometres) is suitable for surprise attack and rapid advance by the Soviet mechanized divisions in East Germany. Even within that northerly stretch the suitable routes are limited and the direction of the enemy's main effort should become clear once he starts crossing the rivers near the border. So it ought to be possible to check him in the forward zone, by timely countermoves, with a two to three ratio of forces, if the NATO covering force is composed of fully mobile and highly trained divisions and is organized with more strategic flexibility.

The more northerly stretch of some 250 miles embraces the front from the Baltic to the valley of the Frankische Saale inclusive – so that a forward defence of the suggested scale (ten divisions) would not only cover the northern plain of Germany but go well round the westward bulge of Thuringia and cover the routes to Frankfurt across the Thuringer Wald.

Behind that end of the main front is posted the bulk of the United States Seventh Army, and it would be natural to continue such a disposition of the mobile reserves – ready to counter a thrust either towards the valley of the Main, and Frankfurt, or into Bavaria. So there would be a good insurance against a circuitous approach by the Russians across the Thuringia–Bavaria frontier. Moreover, such a dog-leg move – first southward and then westward – would entail a loss of time and diminish the Russians' chances of sustaining the speed-surprise required for success in a sudden coup. Another drawback, from the Russians' point of view, is that Bavaria offers no objectives comparable in importance and accessibility with those between Frankfurt and the Baltic.

Analysis of recent war experience tends to show that the higher the ratio of the mobile reserves to the troops holding the forward position the greater is the prospect of defeating concentrated thrust. In past practice the divisions in mobile reserve, not tied to a particular sector, have often been less than a quarter of the whole force. Analysis of operations suggests that a half of the whole force would be a better proportion – even where it entails thinning the forward defence to a hazardous degree.

This is the basis I have adopted in calculation,

and from it comes the suggested figure of twenty-six mobile divisions as the NATO requirement for a Shield Force capable of meeting both the force and space conditions. That number would provide a defence of two to three ratio against the possibility that the twenty Soviet divisions in East Germany might be raised to forty within ten days. It would also provide NATO with the requisite tactical minimum of ten divisions as forward defence there and three for a mobile screen along the mountainous Czechoslovakian border, with thirteen more as mobile reserves for the front as a whole. That would be a reasonably good insurance against sudden attack in any direction.

The required number of divisions would be somewhat less if there was a citizen militia, of the Swiss type, available to man a deep network of defence posts in the forward zone – as a means of helping to delay the enemy's advance while the divisions of the mobile reserve converged upon the threatened sector. This militia would need to be so organized that the posts could be manned at short notice by militiamen living or working near by. It would also be desirable to have such a militia available in the rear areas as a check on an enemy airborne descent to seize key points there and block the counter-moves of the NATO mobile divisions.

If a militia force of this kind was available for local defence the requirement for the main Shield Force might be reduced from twenty-six to twenty divisions – that is, a one to two basis versus the enemy's possible maximum in a surprise offensive on the Central Europe front.

Future Trends in Weapons

Lieutenant-General Sir JOHN COWLEY

From The RUSI Journal, February, 1960

Whatever the relevance of the tactical atomic weapon to the defence of Europe, it has a very dubious value in other potential war situations. The Master General of the Ordnance pointed this out in a lecture which commanded wide attention when it was delivered last November, of which the key paragraphs are reprinted here.

(By permission of the Royal United Service Institution)

THE QUESTION is whether or not nuclear weapons will be used in this kind of (Korean type) war. Here opinion is sharply divided between the people who answer 'yes' and the people who answer 'no'. I will try to put both cases as fairly as I can.

First, the people who answer 'yes'. They argue that a nuclear weapon is just a development of a high-explosive weapon, and nuclear weapons of various sizes have already been introduced into some armies and will inevitably be introduced into many others in the next ten or twenty years. They say that people who try to prevent the use of these weapons are exactly the same people who in the fourteenth century tried to prevent the use of gunpowder. Here is a natural development of military weapons and it is quite unrealistic to believe that wars in future will be fought without them.

They argue also that if we are to confine ourselves to conventional weapons, the first-class Powers will find themselves with little or no advantage over second-class Powers, who are already in possession of the best types of conventional weapons. The improvements in conventional guns and tanks and armoured vehicles in future are marginal, and there will be little difference in performance in a few years' time in such weapons possessed by the less-developed countries than those possessed by the British

Army. Our only real advantage will be that we can have in our armoury an assortment of nuclear weapons which the other side may not possess, and if we do not use these weapons we will fight with one hand behind our back.

I will (now) try to present the case of the people who say nuclear weapons will not be used in a limited war. There are three arguments against their use. . . . First, the moral argument. Can we, who claim to have morality on our side, who claim to be fighting for right against the forces of evil, can we afford to be the first to use these weapons of mass destruction? Even the tactical nuclear weapons, which in military exercises are thrown freely about the battlefield, can have warheads of far greater power than the bombs that destroyed Hiroshima or Nagasaki. These are the only two atomic bombs which have ever been dropped on human targets and one has only to think of what happened in those places to realize what a tremendous impact even small bombs would have on the people in or near the target area. The change from high explosives to atomic weapons is not of the same order as the change from bows and arrows to gunpower; for more than a century the longbow remained a better weapon than the musket. The point is that the change then was gradual, while the change today is violent and sudden, and alters the whole aspect of warfare. It can be argued with conviction that for us to be the first to use these weapons against an enemy who does not possess them is unthinkable on moral grounds. You will all remember the world-wide indignation that was stirred up when poison gas was used against the Abyssinians. It is perhaps easier for a military audience to play down this moral issue, but I believe it to be an extremely powerful one. If nuclear weapons are used by the enemy first, then of course we must be prepared to use them back, but if he has not got them or does not choose to use them against us, then I can see a strong moral objection to using them against him in a limited war.

The next argument is not one of morality but one of expediency. If, indeed, the enemy has nuclear weapons or has a big brother who is willing to lend him some, then should we gain by their use by both sides? The answer clearly is 'no'. Wherever we fight a limited war, it is certain that our Army will be in a foreign country, maintained from an overseas base by a line of communication which will run through a port, or over beaches, or through a series of airfields and landing grounds, or more likely a combination of all of these. There is no target which is more ideally suitable for destruction by a nuclear weapon than a port, and it is almost as easy to knock out a beach or an airfield. The enemy will normally be supplied overland and will therefore not be so dependent on points of concentration on his lines of communication. In other words, whatever logistic system we may employ to maintain our Army in a limited war, we are bound to be more dependent than the enemy on targets which can be knocked out by enemy nuclear weapons. It is unrealistic to think that we shall have 100 per cent air protection of these targets. I believe we must face the unpleasant fact that the logistic system of a limited war force fighting overseas can be destroyed once nuclear weapons are used by the enemy. . . .

. . . I am not saying it is absolutely impossible to maintain a force overseas in the face of a nuclear attack. Such a force could be maintained by making use of every available beach, helicopter, vertical take-off and landing aircraft, and by having the organization and equipment to disperse the logistic system over wide areas. At great expense I think it might be possible to maintain a small force even if nuclear weapons were used against the lines of communication, but I also believe that the logistic effort involved would be out of all proportion to the military value of such a force. . . .

And this brings me to my third point. Is it possible to limit the size and the range of nuclear weapons once they are used by both sides? My answer to this is that it is easy for the side that is winning to make some voluntary limitation of the size and range of weapons, but it is not nearly so easy for the side that is losing to draw an arbitrary line beyond which they will not go. One side or the other has to be willing to lose the war rather than to extend it. It is easy to be meticulous about obeying the rules if you are winning the match, but it is much more difficult if you are being soundly beaten, especially when you are fighting for your life. I personally do not believe that any arbitrary limitation of range and size of nuclear weapons can be imposed once these weapons are used at all.

Revolution on the Battlefield

Brigadier W. F. K. THOMPSON

From The Daily Telegraph
March 8, 1960

As the wisdom of basing the ground defence of Europe on the tactical atomic weapon becomes more keenly debated, the Military Correspondent of The Daily Telegraph *here emphasizes the extent to which Europe has already become dominated by these weapons.*
(By permission of *The Daily Telegraph*)

MR WATKINSON announced in last week's Defence debate that a heavy regiment of the Royal Artillery was to be equipped with Honest John rockets and stationed in Rhine Army.

The Honest John rocket will be the first truly tactical weapon with a nuclear capability to be manned by Britain. The present model has been in service with the United States Army since 1955. Britain is to get an improved model with increased range and accuracy. Honest John is a thoroughly practical piece of equipment. It is simple, quick to respond to calls for fire, and highly mobile. Having no guidance system it is cheap and cannot be jammed by electronic means. The range of the present model is about fifteen miles.

The Belgians, Dutch and Germans, who, with the Rhine Army, make up NATO's Northern Army Group, are already equipped with Honest John and 8 in. howitzers, which also have a nuclear capability. The nuclear warheads for all these weapons are under American control.

What are the characteristics and tactical significance of such weapons?

Virtually any nuclear weapon can be used against a tactical target, that is, a target having an immediate effect on the land battle. Those with the range of Corporal, seventy miles, and less are unlikely to be used against any other targets. It is, however, only those weapons which, unlike the strategic bomber or the long-range rocket, have been designed for close co-operation with other arms that are truly tactical nuclear weapons.

The characteristics of such weapons should be accuracy, quick response to calls for fire, mobility and simplicity. They should be easy to communicate with at Corps level and below, and resistant to enemy counter measures. In the first generation of such weapons are the 280 mm. gun, 8 in. Howitzer and Honest John rocket.

In the debates which rage around the use of nuclear weapons, there is a great, though understandable, reluctance to recognize the revolution in tactics, which these weapons bring about, when the number available to each side for use on the battlefield rises above a certain point. In Central Europe this point has been passed. In what then does this revolution lie and where will it lead us?

Speaking to the Institute of World Affairs in California on December 6, 1959, General Norstad is quoted as saying that he saw NATO's shield forces, which included tactical nuclear weapons, as bridging 'the gap in the strategic spectrum between all-out war and *the conventional power that would be useful in only extremely limited situations*'.

It seems probable that the basis of this statement is the tactical revolution as much as the disparity between the Soviet and NATO's conventional armaments.

Even if only a few nuclear missiles are available to opposing forces for tactical use on and around the battlefield, it is necessary for the forces to seek security in wide dispersion. When the number of these weapons rises above a certain point then tactically vital ground can no longer be denied to the enemy merely by occupation of it. It is at this point that the tactical revolution takes place.

The nuclear weapon ceases to be just a very powerful additional source of supporting fire, taking the place of the large concentrations of

artillery used in the last war. It becomes the tactically dominant and supported arm. Tactical doctrine, organization and the balance of other arms are built round its use – not, as is so often announced, *vice versa*.

It is difficult to give the layman a clear picture of the effects of these weapons in the field. They can deliver a wide range of explosive force, from something in excess of the Hiroshima bomb down to a small part of it. New missiles are under development with an explosive force only a fraction of those at present in service. A single nuclear missile may have an explosive force equivalent to a concentration of hundreds or thousands of guns firing high explosive.

On the other hand, it would be wrong to overestimate the damage done to well-dispersed forces in the field or the danger from fall-out, which is only considerable with a ground burst. Nuclear missiles are the dominant weapon on the battlefield but need the support of all the so-called conventional arms.

For example, the counter-attack plays an important part in nuclear tactics and all troops must be able to move on the battlefield protected from the thermal effects of nuclear bursts – by far the most widespread danger from these weapons – and be able to cross contaminated ground. For these purposes the tracked Armoured Personnel Carrier is being designed. Improved means for obtaining information by day and night, electronic and counter-electronic warfare and the means to move men and equipment by air within the battlefield area are all requirements of nuclear tactics.

Now for Tactics

This revolution in tactics, though as yet ill digested, cannot, I believe, be reversed: it can only be transcended.

In the meantime NATO shield forces are trained in the newly evolving tactical doctrines, and NATO plans based on the employment of tactical nuclear weapons in quantity could not make sense without them. No front-line force can be ready for both nuclear and conventional warfare on a large scale.

There is a school of thought that argues that tactical nuclear weapons neither favour the defence nor save manpower by providing greatly increased fire-power. On balance I would disagree with both propositions, but these are complicated matters depending on many factors which cannot be argued here.

What is important is to realize that both points are irrelevant to the question of the use of nuclear weapons in the present situation in Europe. Here, because the Russians and NATO both have available for tactical use a large number of nuclear missiles, nuclear tactics must be adopted. As General Norstad states, conventional power would be useful only in limited situations.

To point to a revolution is not to approve it. In Central Europe the nuclear missile is now the dominant battlefield weapon and there is no retreat from that position. The situation must, therefore, be lived with until either general disarmament is accomplished or the position transcended through fresh scientific discoveries.

Wide-spread Effect

What is most urgently required is a new breakthrough in weapon development which will produce a controllable mass-effect weapon, as tactically effective as nuclear weapons but without their objectionable features.

Such a weapon should enable defence plans based on nuclear tactics to be prosecuted without recourse to nuclear missiles. That is to say, with small, mobile and highly trained units. There is reason to believe that new developments, in more than one field, are not far off. Both chemist and physicist have likely winners.

Complementary to the weapon of mass effect, there is a need for new and less indiscriminate weapons to strengthen the defensive power of widely dispersed forces. High in priority should be an anti-tank weapon which will put an end to the offensive role of armour. These weapons are needed particularly for forces which have to accept dispersion in the face of an enemy who might have a few nuclear missiles. That is, for use in a theatre where we would not wish to initiate nuclear war and are not tactically forced to do so.

Research into and development of a new weapon of mass effect to replace the nuclear weapon on the battlefield should be given priority next to that of maintaining the strategic balance of power.

Firepower and Manpower

From Red Star, February 16, 1960

Several of the military journals in the Soviet Union have been receiving a number of letters since Mr Khrushchev's announcement in January on strength reductions in the Soviet forces from officers who expect to be retired under the new organization. Many of them want to know why troop reductions are necessary, on what the strength of a modern army depends, and something about the role of the soldier in Mr Khrushchev's missile-dominated army of the future. In the article printed below, a Colonel Grudinin answers one of these letters, quoting first the substance of the question asked by the officer concerned.

IN A LETTER to the Editor, Officer A. P. Butyrov asks us to explain in detail the new approach to the manpower strength of armies in modern conditions, and the role of economic factors in building up the strength and battle readiness of troops. Below we print our reply to Comrade Butyrov's letter.

Comrade Butyrov,

You of course, understand very well that the ability to defend a country, the military might of its armies and its strength depend upon economic and morale-political factors which operate in close interdependence. These factors also decide the numbers of men in the forces, changes in tactics, in strategy, in military art, and in the organization of the armed forces.

You have also studied the report made by N. S. Khrushchev to the fourth session of the Supreme Soviet of the USSR. The report developed the position taken up by Marx Leninism on war and armies, on the defence of socialism and communism, and examined thoroughly the role of political and morale factors in building up our defence capability. The Soviet Union is at present going through a period of unusually rapid development of its national economy, and as a result of this triumph of Leninist ideas, the construction of socialism and the successful building of communism is going forward in all directions. 'On the basis of these successes,' said N. S. Khrushchev, 'our scientists, engineers and workers engaged on the production of weapons have created new types of armaments which are the most modern, and represent the last word in science and technology.'

These great successes in the armaments field have caused us to look at the problem of manpower in the armed forces in a new light. Nowadays, the defence potential of a country depends not so much on the number of men under arms as on fire-power and production resources, leaving aside political and economic factors. But you may ask: why, in view of the tremendous growth of fire-power did the numbers of men maintained under arms by the warring States in the Second World War not fall, but increase?

The answer is to be found in the type of armaments produced, and in the widespread character of military operations. The first and second World Wars were fought on land, on the sea, and in the air on many fronts all over the world, stretching for many thousands of kilometres. As fire-power grew, the number of men in each unit or formation fell. For example, in 1944, the fire-power of a Soviet infantry company increased ten times in relation to the number of automatic weapons, but the company manpower strength was halved. On the other hand, the number of regiments and divisions in the army as a whole rose, and therefore more men were maintained under arms.

Our armed forces today have been supplied with a range of weapons the like of which the human race has never seen before. Their fire-power surpasses millions of times that of the weapons used in previous wars. Our rocket weapons, for example, with their great speed and high trajectory, and ability to operate in any weather conditions, can carry hydrogen

bombs and warheads to any part of the globe. They allow us to deliver powerful blows simultaneously against a large number of targets, to effect great mobility of fire-power, and to make decisive changes in the situation by our massive nuclear striking power. The ballistic weapons which our armed forces possess are being perfected, and this process will continue. Of course, such weapons are also to be found in the armies of some of the capitalist countries, including the United States. But as speakers at the fourth session of the Supreme Soviet pointed out, we will do everything in our power to use the time we have won in the development of rocket weapons to keep our lead in this field until an international disarmament agreement has been reached.

What conclusions can we draw so far? We can say that the Soviet armed forces possess modern scientific weapons whose fire-power has never been attained by any other army. The fire-power is sufficient to be an obstacle to a probable opponent, to deter him from attack, and – in the event of attack – to deliver a crushing, annihilating retaliatory blow.

With this background in mind, Comrade Butyrov, we can now turn to the problem of manpower in the armed forces. According to the law passed by the Supreme Soviet, the Soviet armed forces will be cut by 1,200,000 men, that is by one third, and will comprise 2,423,000 men. Does this mean a cut in fire-power? Certainly not. It is the development of our firepower which allows us to make such cuts in our man-power. But it is quite clear that we are speaking of the man-power strength of our forces in peace time, that is, of the strength needed, according to our fire-power, to deliver a crushing blow to any aggressor. But if the imperialists risk launching a new war, it will be waged on many fronts and over great distances. And this would naturally require an appropriate increase in the manpower strength of our forces. Furthermore, our military doctrine maintains that it is impossible to regard rocket weapons as capable of solving all problems in war. The successful conduct of military operations in a thermo-nuclear war requires the co-ordinated use of all forms of armed conflict, and the united efforts of all the services. This means that we must retain all arms of service in our forces, in their proper proportions.

In this way the problem of manpower in the forces cannot be considered in peacetime and wartime under the same heading. At the session of the Supreme Soviet the question of a move towards a territorial system of our forces was raised, if a total disarmament agreement is not reached. It seems likely that such a system would be able to provide the army with trained cadres, and also a population which had undergone military training, and was able to handle modern weapons.

Of course the international situation has a great influence on the manpower strength of an army. When the international situation is critical, and a peace-loving country finds its security threatened, then it must increase the number of men under arms. But if tension drops, the improved international situation allows it to cut the manpower in its forces.

From the above, we can conclude therefore, that in spite of the substantial cut in the manpower strength of our armed forces, our fire-power is at the required level to enable us to give a crushing rebuff to any aggressor. But a massive fire-power and up-to-date weapons cannot by themselves secure the high defence potential which we need. Here we can recall the Marxist-Leninist truth that the real strength of an army, the decider of its fate, the creator of its efficiency, and its battle readiness, is the human factor. This is the soldier, the man who has mastered modern military techniques and weapons, who has acquired all the political and morale qualities such as determination, courage, manliness, and readiness to accept discipline. The training of such troops is the main aim of our commanders, political workers, Party organizations and Youth movements of our Army and Navy.

France's Missile Programme

General L. M. CHASSIN

From Interavia, February, 1960

It has been clear for some time that France's nuclear weapon programme will only increase her military potential in so far as she can develop an up to date means of delivery, that is become a nuclear-missile power. Her prospects in this field are examined by a former officer in the French Air Force.

(By permission of *Interavia*)

'WHETHER our primary concern be atomic power or speed,' writes General Guérin, Chairman of the Scientific Committee for National Defence, 'the missile's ability to extend operational space in area and volume makes it the ultimate weapon in either tactical or strategic warfare, replacing the cannon and the aircraft both on the battlefield of restricted area and on an intercontinental scale.'

If a country wishes to retain its position as a great Power, it is automatically obliged to possess both missiles and nuclear explosives. This is the case with France today, as General de Gaulle recently reminded his audience during an address at the Centre des Hautes Etudes Militaires in Paris.

But if the designing of modern missiles lies within the grasp of any Western country at a reasonable stage of development, the same cannot be said for the many difficult problems involved in missile construction. Raw materials, technology, tooling, test equipment, computers, all these things cost money, and when we approach certain projects we may legitimately wonder whether they are not too ambitious for a country of medium size, even one with a firm scientific tradition and a plentiful supply of engineers and technicians.

Last but not least, France is part of a great alliance led by the United States. Nearer home, France has close ties with certain Western European countries. One can thus conceive of various solutions to the problem of obtaining the most modern war *matériel*. One answer would be for the United States to act as a source of supply to her allies, either direct or through the medium of construction under licence. Although this solution would be ideal from many viewpoints, particularly as regards the standardization of weapons, without which no effective alliance can exist, there are numerous obstacles to its realization; on the one hand, United States Law, which forbids the divulging of certain secrets, on the other, a certain national individualism.

The second solution would be a purely European one. It would involve the creation of an integrated industry in Western Europe, which might or might not be supported by the United States. There is no doubt that a suitable association of the six States of 'Little Europe', particularly if joined by Britain, would be capable of solving the most complex problems, while ensuring the safety of vital industries whose very existence will be threatened unless union is rapidly achieved. Many difficulties, political, financial and commercial, have hampered the complete realization of this fertile idea, but let us hope that it is well on the way to success.

The third solution is to try to manufacture one's own missiles. But in this case we must be very cautious and confine ourselves strictly to what is necessary and to what is practicable.

The French missile programme takes into account all the possibilities just mentioned. When France receives, under the Mutual Development Assistance Programme (MDAP), missiles which appear modern enough to meet her requirements, she is quite willing to accept them and omits them from the corresponding part of her own programme. If, on the other hand, she considers that what she has been offered is inadequate, she first tries to produce something in collaboration with another country. Finally, if all else fails, she does not hesitate to forge ahead alone, at any rate in the fields in which she feels she is likely to succeed.

Air-to-air missiles

The present programme envisages the manufacture of missiles derived from those already in production, such as the Nord 5103, or about to go into production, such as the MATRA 511. The aim is to have available air-to-air missiles which can be used *in all weathers* for attacks *at all angles*, in contrast to current missiles, whose limitations are often considerable in both these respects.

Out of the MATRA 511 there has evolved the project for the MATRA 530 which, fitted with a semi-active homing head of the Sparrow III class, could carry a powerful warhead capable of destroying any target. Until the MATRA 530 is ready France is adopting the Sidewinder.

Air-to-surface missiles

There are several categories of air-to-surface missile, which can be classified according to range: short (up to 10 miles), medium (up to 60 miles) or long (air-launched IRBMs).

For the time being France's ambitions are modest; she envisages building only the simplest air-to-surface missiles. The air-to-surface version of the Nord 5103, with a conventional warhead weighing about 90 lb, has a maximum accuracy of about 5 yards at a range of 5 miles; this makes it a highly lethal weapon for tactical support.

In addition to the Nord 5103 (in which, incidentally, Germany is also said to be interested), Nord-Aviation is developing the AS-30. This weapon, also manually remote-controlled, will be more highly developed and capable of carrying a 450-lb nuclear warhead over a distance of 10 miles. Fitted with a proximity fuse and operating at speeds well above that of sound, it could be launched at speeds over Mach 1. The AS-30 is designed to equip France's Mirage IIIs.

The French programme makes no provision for any medium- or long-range air-to-surface missile.

For the sake of completeness one can include in the present category the Nord SS.10, 11 and 12 missiles used by both the Air Force and the Navy; the latter has had to solve particularly difficult operational problems, such as protection against spray and waves, storage in sea air, the devising of a warhead suitable for naval targets, etc.

Surface-to-air missiles

This category has been under study for many years in France by all three Forces and includes a number of interesting developments; among these are the ACAM to cover the deployment of ground forces, and the medium-range MATRA 422, to say nothing of the DEFA Parca, which is also used as a training missile. But the possibilities offered by the MDAP in the form of the Nike-Ajax and Hercules on the one hand, and the appearance of the Hawk for low-level defence on the other, have led France, very wisely, to abandon her own developments, in spite of the fact that some were highly promising. Consequently, the only current French surface-to-air missile is the Navy's well-known Masurca. With a range of 20 miles, a speed in excess of Mach 2 and a ceiling of 70,000 ft, the Masurca is a solid-propellant anti-aircraft missile. With a total weight of 3,200 lb, it has a conventional warhead weighing over 220 lb; the Navy is now considering manufacturing continuous rod warheads of the type used on the Terrier, Talos and Hawk, which are far more effective against aircraft than ordinary fragmentation warheads. The missiles are guided by the alignment method, by which a radar with double scan measures the angular separation between the missile and its target and passes these data to a computer, which transmits trajectory corrections to the missile. The Masurca, which is built at the Navy's Ruelle industrial plant, is intended to equip all French combat vessels of over 3,000 tons.

The production of the Hawk, whose performance and general characteristics are well known, will be the first example of Allied collaboration in the weapons field. This step is of especial interest and its success is earnestly to be desired.

The industrial organization of the programme is as follows: Société Européenne de Téléguidage (SETEL), a company with international participation constituted under French law, will be the 'prime European contractor', in other words it will allocate work under the orders placed with it by the five European Governments of Belgium, France, West

Germany, Italy, and the Netherlands, and by the United States Government, and will be responsible for contacts with American industry and for dealing centrally with the various problems involved in integrated production. Five 'prime national contractors': Ateliers de Construction Electriques de Charleroi, for Belgium; Compagnie Française Thomson-Houston, for France; Telefunken GmbH, for the Federal Republic of Germany; Società Finanziaria Meccenia (Finmeccanica), for Italy; and N. V. Philips' Gloeilampenfabrieken, for the Netherlands, will carry out the orders passed to them by SETEL. CFTH is also responsible, under contract to SETEL, for central technical organization and co-ordination of production.

The board of SETEL consists of representatives of the five 'prime national contractors'. Its present Chairman is Marcel Laveran, its Managing Director Henri Angeles d'Auriac, both of CFTH. SETEL's headquarters are at Paris.

The new company's first task was to get in touch with representatives of the US Government and of Raytheon, manufacturer of the Hawk. Construction of the various sub-assemblies was so shared out as to reduce the number of assembly points to a minimum. Finally, a technical assistance contract was signed with Raytheon.

Although work on the Hawk is expected to last five years, SETEL has no doubts of its being brought to a successful conclusion, for the results obtained in the United States are such that the missile is most unlikely to be obsolete by the time it goes into production in Europe. The Hawk is a two-stage solid-propellent supersonic missile, with semi-active guidance system using continuous-wave radar, and can be operated against aircraft flying at altitudes between zero and 38,000 ft. Its combat range is 22 miles, which in France puts it into the category of army missiles. It will be used within the air defence framework, and battalions, which will consist of a total of 144 fully mobile missiles, will be at the Air Force's disposal. Some battalions will be under NATO control, others under national control.

France is well aware of the great production difficulties involved. With such a programme it is not enough merely to be in possession of the manufacturing blueprints. Methods of research, construction, adjusting and checking are of considerable importance. SETEL is, however, optimistic, and one can but wish the venture all the success it deserves. If the European Hawk project does succeed, it may have a decisive influence on the organization of the free world.

Surface-to-surface missiles

In spite of the fact that she had already drawn up a programme for surface operations, France decided to depend entirely on MDAP. She is still, however, continuing theoretical studies, and the abandonment of the SE.4200 and SE.4500 does not mark a definite change in trend. It is certain that on the atomic battlefield (if ever there is one) the ground forces will need at least two kinds of guided missile: a highly mobile missile with a high rate of fire and range between 6 and 30 miles, which can be quickly set up in a battery for use by a division; and a long-range weapon for army corps and above, which could carry an atomic warhead over a distance of about 160 miles.

For the time being, however, since financial resources are limited and more urgent matters are in hand, the French ground forces will make do with the Honest Johns, Corporals and Redstones allocated to them by our American allies.

The Navy

The naval battlefield has specialized requirements, and operating conditions are particularly harsh. The chief of these are briefly listed below.

The space on a ship is very confined, particularly across the beam; solid bases for the installation of missile launchers are few and far between; handling is difficult; it is necessary to take foolproof precautions for storing propellents and warheads; equipment must be proof against corrosion and mildew; there is a great deal of roll and pitch; it is impossible to use a double radar system due to interference from the ship's hull. What is more, if the enemy is to be either bombed or torpedoed below the water line, there is the difficult problem of water entry. But notwithstanding these difficulties, naval technicians have some very fine achievements to their credit.

Since the essential mission of the French fleet is anti-submarine warefare, DCCAN (Direction Centrale des Constructions et Armes Navales) has developed the Malafon, which is to go into service next April on the escort vessel *La Galissonière*.

Although DCCAN is the moving spirit behind the naval missiles, Latécoère, of Toulouse, is the firm responsible for building the Malafon.

The Air Force

First a word of reminder that the French Air Force will also receive under MDAP medium-range, tactical surface-to-surface missiles in the shape of the Mace. The range of this successor to the Matador exceeds 600 miles. A Mace squadron will be attached to the French Tactical Air Force in Germany within the framework of NATO. It is regrettable that this excellent missile has the major disadvantage of being interceptible as its speed hardly exceeds 600 mph.

The French IRBM

Since the formation of SEREB (Société d'Etudes et de Réalisation d'Engins Balistiques) it is known that France, having decided to manufacture and test nuclear bombs, has also decided to explore the problem of a missile to carry the bomb. The striking force which is in the programme of the French President and was to have consisted initially of Mirage IVB bombers, was reduced in the last Budget. This suggests that the first design studies have convinced General de Gaulle that there is another method within his country's capability – the IRBM.

Agreed, this is a bold gesture, and the difficulties that can be foreseen in the manufacture of the Hawk, where the French will be guided step by step, seem to make the engineers of SEREB appear foolhardy. Nevertheless they are responsible individuals who base their propositions on solid reasoning.

SEREB, which is both controlled and financed by the Government, has as its President M. Cristofini, previously a senior Treasury official, and then for a long time connected with aviation matters in WEU.

Firstly it is necessary to know exactly what is required, and clearly define the French concept of deterrence, which is not exactly the same as the American idea.

The American concept is based on the possibility of the victim of an attack inflicting such losses on the aggressor in retaliation that his very existence will be threatened. In the French concept, on the other hand, it is not necessary to be able to destroy the aggressor but to be in a position to strike hard enough to induce this reasoning – 'Knowing the retaliatory power that France possesses, are the gains counterbalanced by the risks that must be taken?' It is obvious that for such a deterrent it is not necessary to possess thousands of advanced missiles, and one can accept reduced performance and fewer numbers.

Having established the definition of deterrent, one can attempt to investigate what the principal features of the French IRBM and its system of deployment will be. The line of development chosen will depend on France's technical and industrial resources, and an examination of these resources should reveal what this line is most likely to be.

Firstly, as regards propulsion, the question arises, solid or liquid propellents. The advantages and disadvantages of the two types are well known. Both are roughly equal in specific impulse; solids are superior for handling and storage, but present certain difficulties, such as the manufacture of fillings exceeding a certain size, the change of chemical characteristics through aging, and the caution required in checking the manufacturing processes. Consideration must also be given to the fact that no great advances appear likely in the near future in the field of solid propellents. In comparison, liquid propellent developments give indications of enormous progress, with specific impulses exceeding 240 seconds and gas velocities exceeding 11,000 fps.

But France has had sound experience in the manufacture of solid propellents, thanks to the nationalized powder factory (Service des Poudres). Also the logistic and safety advantages of solid propellents are such that, assuming their use does not inflict too great a penalty in terms of performance, they are the obvious choice. This is particularly the case if, as we have mentioned earlier, performance is a secondary consideration. One can reasonably assume,

therefore, that France will adopt the use of solid propellents, and the recent decision to modernize the powder plant at St Medard near Bordeaux seems to bear out this reasoning.

Guidance

Another choice has to be made in the guidance field, between mechanical (inertial guidance) and radio systems. We can assume that the problems of mechanical guidance can be simplified to the extent that it lies within the scope of French industry. Studies have already been going on for a considerable time on the question of inertial guidance equipment. Admittedly the difficulties of manufacturing gyros and accelerometers are enormous, and the investment required to carry a project from the laboratory to the production stage will be such that many observers consider that it will exceed French capabilities. But the main argument which militates in favour of the inertial navigation system, apart from the fact that France can always hope for American technical aid, lies in the fact that it will take many years of research to acquire all the data on the propagation of radio waves at very high altitudes – and the IRBM cannot wait. That is the reason why France will choose the mechanical system despite the disadvantages it possesses.

Performance

So far, so good, but before we can get a clearer picture of the projected missile, we must examine what the military expect of it. Firstly, what will be its range? on this point we have an accurate indication: on one side the rejection of Polaris, on the other, what we know of the performance of the Mirage IV. It is certain that in France the range of the Polaris was thought to be too short. The distance from Nancy to Moscow is of the order of 1,500 miles, and there are industrial concentrations in the Urals which it is difficult to overlook. One can therefore estimate that the range of the French IRBM will be in the neighbourhood of 2,000 miles. As to its accuracy, we have seen that we have been compelled to make concessions so as to avoid being faced with too difficult a problem. We would only attack large area targets (it being clearly understood that we only retaliate after being attacked ourselves and that we act in legitimate self-defence). An accuracy of 0.2 per cent or 4 miles in 2,000 will be ample if not excessive.

Also, what will be the size of the missile's warhead? All will depend on the results obtained from the French atomic bomb. But there is no reason to assume that the latter will be greatly different from other bombs, and we shall probably not be far wrong if we take the maximum weight of the missile warhead as being roughly one ton. Finally, by combining all these hypotheses, one arrives at a two-stage missile weighing approximately 30 tons.

Deployment

It is also necessary to know how we will deploy these missiles in order to provide maximum protection for them and enable them to best fulfil their deterrent function.

As in America, we find ourselves faced with three possible types of deployment: submarine, as for the Polaris; mobile (on roads and railways); and finally, fixed, underground and hardened sites.

Politically, the submarine deployment would give the best results. But it presents considerable technical difficulties and also a prohibitive price for France.

Mobile ground deployment is possible in the large open areas of America, but in a small territory such as France, it is expensive, does not provide a great degree of safety for the unit, and the cost of maintenance is exceedingly high.

We are therefore led to the third system: fixed deployment. Fortunately France does not lack mountainous areas where her IRBM's can be established in good conditions; Corsica, the Alps and the Massif Central lend themselves particularly well to underground and hardened launching sites, assuring a high factor of survival.

It should be noted that a recent American article[1] arrived at the same conclusions in comparing the cost of Polaris (submarine included) with that of fixed missile sites. The latter are four times cheaper than the former.

What will be the outcome of this French programme? It is serious, and will be pursued with vigour, in the desire to succeed at all costs. Its success will mean a considerable increase in French prestige.

[1] *Fortune* Magazine, November, 1959.

– And its Object

RAYMOND ARON

From Le Figaro

March 8, 1960

France's foremost political commentator here analyses the purpose of the French nuclear weapon programme.

(By permission of *Le Figaro*)

L'EXPLOSION de la première bombe atomique française marque un succès de la science et de la technique françaises, elle ne résout évidemment aucun des problèmes que posent à la France les nécessités de la défense nationale à l'âge atomique.

Ecartons d'abord les formules toutes faites que m'oppose l'amiral Lepotier, dans un article de la *Revue de Défense Nationale*. Il n'est pas vrai que 'le commerce suit le pavillon porté à la poupe des navires de charge mais aussi à la poupe des navires de guerre modernes de construction nationale'. La République fédérale de Bonn a vendu ses machines dans le monde entier, alors qu'elle ne possédait ni navires de guerre ni encore moins une force de frappe nationale. Suggérer que 'Nasser n'aurait pas fait son coup de force si nous avions disposé d'une force d'intervention aussi immédiatement disponible que l'est la VI[e] flotte U.S.' est, pour le moins, discutable. Affirmer que 'le poids d'un pays dans les affaires mondiales – desquelles sa propre existence dépend de plus en plus – se mesure, en fin de compte, aujourd'hui comme hier, à sa puissance d'intervention concrète en tous domaines et en tous points de la Terre', c'est donner des arguments à ceux que l'amiral Lepotier appelle des 'défaitistes', car la puissance d'intervention concrète, qu'il s'agisse d'intervention militaire ou économique, est, en fait, fonction des ressources disponibles. Or, si la France consacrait 2,000 milliards de francs légers à la défense nationale, le montant, supérieur de quelque 400 milliards au budget réel, ne représenterait que quatre milliards de dollars, soit moins du dixième du budget militaire américain. Les vrais 'défaitistes' sont ceux qui, prisonniers de conceptions d'un autre âge, veulent que la France se lance dans une compétition où elle a perdu d'avance.

Revenons aux questions sérieuses, c'est-à-dire au choix raisonné entre des solutions dont chacune présente des inconvénients. La France a la capacité scientifique de fabriquer des bombes A et même, dans un délai de quelques mois ou de quelques années, des bombes H. Probablement même la France sera-t-elle capable de se donner, d'ici dix à vingt ans, une force de frappe purement nationale, avec des bombes H et des engins balistiques à moyenne portée, mais l'exemple anglais nous impose au moins d'envisager les implications et les servitudes de la décision qui pourrait être prise de tout subordonner à la constitution d'une force de frappe, aussi puissante que possible, à la disposition du seul gouvernement français.

Les Britanniques possèdent aujourd'hui des bombes H et des bombardiers stratégiques, dont les rayons d'action sont de plusieurs milliers de kilomètres. Il n'ont pas le sentiment, pour autant, de posséder un pouvoir de dissuasion autonome (l'expression est la traduction admise du terme *deterrent*). Pourquoi? Parce que l'arme de dissuasion doit être capable de survivre à une attaque massive, par surprise, de l'ennemi, pour remplir effectivement sa fonction. Or, les experts anglais se demandent combien des aérodromes sur lesquels sont stationnés les bombardiers stratégiques, combien de ces bombardiers seraient épargnés par le premier coup porté par les engins adverses.

De même, la controverse autour des 'Blue Streaks', engins balistiques à moyenne portée de construction anglaise, a pour cause la vulnérabilité des rampes de lancement et le temps nécessaire à la mise à feu. Même avec un réseau radar perfectionné, bombardiers ou engins balistiques ne disposeraient que d'un prévis qui se compterait en minutes, pour échapper à la destruction au sol. Une force de frappe nationale ne constitue pas un pouvoir de dissuasion aussi longtemps qu'elle n'a pas une grande chance d'être en mesure d'infliger des *représailles* à une attaque par surprise. En ce sens,

la Grande-Bretagne a une force de frappe nationale plutôt qu'un pouvoir de dissuasion. Ce n'est pas être 'défaitiste' mais réaliste que de rappeler que, pour acquérir le pouvoir national de dissuasion, la France doit accomplir trois tâches: fabriquer des bombes, disposer de véhicules porteurs, assurer à ceux-ci une relative invulnérabilité.

Bien que, sur ce dernier point, elle ait peut-être, en raison de la géographie, quelque supériorité sur la Grande-Bretagne, la France, réduite à elle-même, n'atteindra, avant 1970, qu'à des résultats limités. Entre 1963 et 1965, elle possédera quelques dizaines de bombardiers supersoniques, qui risquent d'être vulnérables. Peut-être pourra-t-elle se donner, vers la même date, ou quelques années plus tard, des engins balistiques de portée intermédiaire, mais si nos alliés nous refusent toute coopération, scientifique et technique, le coût en sera élevé et ces engins seront peut-être exposés au même risque de destruction au sol que les bombardiers. Enfin, comme nous l'avons indiqué dans un précédent article, la Grande-Bretagne, avec un budget de défense d'un quart plus élevé et sans obligations comparables à celles que nous avons en Algérie, éprouve des difficultés croissantes à maintenir le minimum indispensable d'armements classiques, sur terre, sur mer et dans les airs, tout en dépensant des centaines de millions de livres par an pour acquérir le pouvoir de dissuasion.

Avant de s'engager sur la voie au bout de laquelle la Grande-Bretagne se trouve aujourd'hui, la France devrait, me semble-t-il, s'interroger sur le meilleur emploi que l'on peut faire de ressources limitées, plus précisément établir à quelles conditions elle pourrait obtenir communication des secrets (en matière de bombes) et aide technique (en matière de fabrication d'engins). Il est incontestable que, pour l'instant, les Etats-Unis refusent à leurs alliés communication des secrets qui n'en sont plus pour celui qui est considéré comme l'ennemi éventuel. Mais, d'un autre côté, la France demande aux Etats-Unis de lui donner les moyens d'une diplomatie entièrement indépendante, c'est-à-dire d'une diplomatie qui, vue de Washington, sera aussi imprévisible et gênante que possible. La façon française de demander n'est donc guère plus raisonnable que le refus américain.

Dans une négociation avec les Etats-Unis, le général de Gaulle dispose d'atouts uniques, en raison de l'admiration qu'il inspire à certains de ses interlocuteurs, des craintes qu'il inspire à d'autres, du sentiment commun aux uns et aux autres que la France ne peut provisoirement se passer de lui. Mais les meilleurs atouts diplomatiques ne modifient pas 'la nature des choses'. Nul homme d'Etat ne peut obtenir l'aide d'un allié pour une politique que ce dernier juge contraire à ses propres intérêts. Mais, dans certaines conditions, les Etats-Unis cesseraient de considérer une force de frappe, française et européenne, comme contraire à leur intérêt.

Australia's Defence Policy

(*continued from page 124*)

AIR FORCE

The RAAF at present consists of:

3 Bomber Squadrons (Canberras)
3 Fighter Squadrons (Avon Sabres)
2 Maritime Reconnaissance Squadrons
(1 P.2V.5 Neptunes, 1 Lincoln)
2 Transport Squadrons (C.130)
2 Control and Reporting Radar Units.

The Sabre is being re-equipped with Sidewinder. No decision has yet been taken on a replacement for this aircraft. The Lincoln Squadron will be re-equipped with the later Neptune version – the P.2V.7.

Bloodhound Mk. I is being purchased for A.A. defence and 8 helicopters for a RAAF search and rescue requirement and for Army liaison and casualty evacuation.

The 5 squadrons of the Citizen Air Forces will be converted to a non-flying basis and trained in RAAF functions which they could usefully perform in times of emergency.

Australia's Defence Policy

On November 26, 1959, Mr A. G. Townley, the Minister of Defence, made a statement to the House of Representatives on the Government's review of the three-year defence programme (1961–3). This review contained a number of important decisions on Australia's defence organization and provision and the main points are summarized below.

GENERAL

The Government sees no reason to vary the broad strategic principles on which their defence policy has been based since the previous review in 1957. Briefly, these are that global, or full-scale, war remains not impossible, but unlikely, as a deliberate act of policy. However, limited war could break out in various unstable areas.

The primary aim of Australia's defence effort should therefore be the continued improvement of her ability to re-act promptly and effectively with her allies to meet limited war situations.

Finally, Australia is a small nation with limited resources. The most effective way of ensuring her safety is through association with allies in the collective defence arrangements which have been developed in her area of strategic interest. The Government therefore continues to attach the highest importance in its defence policy and planning to participation in British Commonwealth defence co-operation, SEATO and ANZUS.

NAVY

The aircraft carrier *Melbourne* will remain operational until the end of the life of her present generation of aircraft (mid-1963). After this the Fleet Air Arm will not be re-equipped with new aircraft, which would require a new carrier from which to operate. The provision of this ship and the aircraft would be beyond Australia's resources without unduly prejudicing other essential defence activities.

The Navy will therefore concentrate on the anti-submarine role and four new anti-submarine frigates are under construction in Australian yards.

Consideration is being given to the introduction of a submarine arm and to the possibility of building submarines in Australia. Other possible requirements about which inquiries will be made, include the surface-to-air guided weapon destroyer and the provision of guided weapons for existing escort vessels.

ARMY

To provide mobile and readily available forces adequately provided with modern weapons, there must be a major re-organization of the Army.

National Service training makes excessive demands on the Regular Army and it is therefore being suspended from the end of 1959.

The Regular Army will be re-organized as follows:

- The strength of the Brigade Group (at present 2 battalions totalling 4,000) will be raised to 5,500, a third battalion being added.
- A logistic support element, to support the brigade, of 3,000 men will be raised.
- The Brigade Group will be additional to the battalion group in Malaya.
- The total planned strength of the Regular Army will be 21,000.

The Citizen Military Forces at present consist of 20,000 volunteers and 30,000 national servicemen, the latter not being liable for overseas service. Under the proposed re-organization the planned strength will be 30,000 volunteers organized in six infantry brigade groups, with appropriate combat and logistic support forces, replacing the present framework of 3 C.M.F. divisions.

(*continued at foot of page 123*)

Britain's Defence Debate

On February 29 and March 1, 1960, the British Government's Annual White Paper on Defence (Command 952) was debated in the House of Commons. The three main subjects discussed were:

(*a*) Whether Britain should maintain an independent nuclear deterrent and if so, what form it should take.

(*b*) The proper balance between nuclear and conventional forces.

(*c*) The mobility of conventional forces.

In the extracts below, an attempt has been made to illustrate the wide variety of views put forward in debate. The views set out here are, with the exception of ministers' and party leaders', those of individual members and no attempt has been made to strike a political balance in the selection of extracts. Each subject is headed by the relevant paragraphs of the White Paper in italics.

POLICY

The policy of the Government, in co-operation with our Allies, is to prevent war. We intend to do all in our power to achieve by negotiations comprehensive disarmament under proper controls. Meanwhile our defences must be maintained.

During the third year of the Five-year Plan for Defence, the Government's broad defence policy has undergone no major change. . . . Our defence effort must be flexible, since the threat of war takes many and changing forms, and it must be expected that there will be shifts of emphasis from time to time to meet changing circumstances.

KEEPING THE PEACE

This country makes an important contribution to the preservation of peace by strengthening the nuclear power of the West. This is only one component of the deterrent. Because of the need to meet local emergencies which could develop into a major conflict, conventionally armed forces are a necessary complement to nuclear armaments.

Against the continuing Communist military threat, the defence of the free world rests on a complex of collective security alliances. Great Britain plays her part in NATO, CENTO and SEATO, and in addition provides a military presence to help preserve stability in politically sensitive areas for which she has a particular responsibility.

The maintenance of the strength of these alliances is a vital part of our defence effort.

Our concern for maintaining the strength of this country's contribution to NATO has recently been shown by the decisions of the Government to retain for the time being seven brigade groups in the British Army of the Rhine, and to defer the withdrawal of certain fighter squadrons from RAF Germany.

Mr Harold Watkinson (Minister of Defence)

The Government are now engaged on a detailed review of our defence effort. The reasons for doing it now lie in the immense technological changes taking place in defence and new methods of computation and production which are enabling problems to be solved now which could not even have been formulated with precision, a few years ago. In a general comment on what we are trying to do I should say that it probably will lead us to give greater emphasis on mobility and flexibility.

It is my view that the whole of our defence effort is really the deterrent of war and aggressive action. We must be ready at any point and in any circumstances to produce instant reaction to an aggressor. One has also to be clearly seen to be ready so that our defence effort does not present a fixed position which can easily be turned.

Opposition amendment –

'*recognizing the need for an adequate policy for collective defence and security, has no confidence in the defence policy of Her Majesty's Government which proposes to continue the vacillations and confusions of the Government's nuclear strategy, thereby involving the nation in further substantially increased expenditure whilst providing no prospect of effective defence.*'

moved by Mr George Brown (Labour)

It is our case that the £12,000 million which has been spent since 1951 has, in fact, brought us weakness, indecision and uncertainty. . . . If at the end of nine years, after nine Ministers of Defence have been in office and after the expenditure of that sum of money the cupboard is as bare as before, it should not be left just to Opposition Members to ask why. Every hon. Member should be very concerned about it. We do not conclude that it is unnecessary or unprofitable to pay for defence. Our case here is that the premium is getting dangerously high unless the cover is really adequate, and I doubt whether it is.

The purpose of defence is, of course, the purpose of our foreign policy and our defence policy, and provision can only reinforce the policy we are seeking in the international field. It cannot replace it. That is abundantly clear from the debate – three weeks ago, when the Government's foreign policy was shown to lack clarity and drive. Many of the Government's doubts are reflected, I think, by the doubts and in confusions in the Defence White Paper.

Mr J. Grimond (Liberal)

It is fairly easy to attack any system of defence but it is difficult to defend it. I would say that all defence policies are wrong, but some are wronger than others and one of the wrongest is that of the Government.

STRATEGIC NUCLEAR FORCES

The V-bomber force remains the United Kingdom's main contribution to the strategic nuclear power of the West. Supplementing the V-bombers is the Thor missile. Arrangements are being made with the United States which will provide a ballistic missile warning system for this country.

One of the main aims of research and development in the field of the strategic deterrent is to devise a means of delivery that is invulnerable to the opposing defences. The development of the British ballistic missile Blue Streak is continuing. However, it may be decided not to rely exclusively on fixed-site missiles as the successor to the medium bomber armed with the stand-off powered bomb. Therefore the possibilities of mobile launchers, whether aircraft or submarines, for long-range delivery of nuclear warheads are being investigated.

Mr Watkinson

. . . We must get into the nuclear submarine business because we may need these submarines for the hunter-killer role and equally for the missile carrying role.

At present we make our chief contribution to the nuclear power of the West by using the V-bomber force as the main means of delivery. Perhaps I should make it plain that this is not our sole contribution. In the Navy there are the Scimitar and Sea Vixen with a nuclear capacity, and we shall soon have the N.A.39. In the Army, there are two Corporal Regiments of the Royal Artillery and we shall soon have Honest John. In the RAF there is the nuclear capacity of the Canberras and the Thor.

The Mark II V-bombers are now coming into service. They are being equipped with the Blue Steel which is really a flying bomb. This weapon has a stand-off capability, and that, combined with the greatly improved performance of the latest V-bombers makes the force fully able to fulfil its planned task until the mid-1960s. In other words, Great Britain's contribution to the nuclear power of the West is already settled for some years ahead.

There has been much comment about the supposedly short time of warning which the BMEW system gives. In fact it would give about fifteen minutes warning, providing that the rockets were sited far enough back to have any protection in their turn. It is only if the most unlikely circumstances are taken that the system would give only four or five minutes warning. Even this warning would be enough to see a substantial proportion of the V-bomber force in the air.

I want to set out the future possibilities, as the Government see them, of maintaining our independent contribution in the late 'sixties and early 'seventies. As I have shown, we still have time to make our choice. The first thing is the Blue Streak missile. This is a liquid-fuel missile, and can, therefore, be deployed only on a fixed site. Another alternative is the Polaris missile, a solid fuelled rocket generally designed for a mobile role. A third example, and it is a good example of the rapidity of technological change

that even since I have held this office (October, 1959) we have seen the emergence of what may be a new break-through in missile deployment. This is a delivery system called Skybolt – a ballistic missile of considerable range and great hitting power, which can be launched from an aircraft. It is, of course, only in the development stage at the moment, and the promise of such a weapon is not always fulfilled.

Nevertheless Skybolt would undoubtedly be eminently suitable for our V-bomber force and would thus extend its life very considerably. The difficulty with the V-bomber force in the end years of the 'sixties is not that the force will be worn out but that Blue Steel will by then have become increasingly vulnerable to the surface-to-air missiles which we must assume that the Russians will have in very large numbers. Skybolt is invulnerable to this form of attack.

Final decisions on the balance we should hold between fixed site missiles and mobile launchers are not yet taken. I believe that the West must rely more and more on dispersal and more and more on the mobile missile and their largely indestructible deterrent.

Mr Brown

. . . Last of all, I come to the area of the biggest mess, the greatest wasteful expenditure, the area of the long-range missile – the Thor and the Blue Streak. The White Paper makes it clear, and I thought the Minister made it clear, that Blue Streak is now about finished as a concept for succeeding the V-bomber as a means of delivery of our strategic weapon.

Paragraph 36 . . . makes it clear, but it says a rather peculiar thing which was rather borne out by what the Minister said today. Having dealt with Blue Streak, he said: 'However, it may be decided not to rely exclusively on fixed site missiles as the successor'. . . . We really are not, are we, playing with the idea of having fixed site missiles and some air-launched missiles and some submarine-launched missiles? If we are, we had better get it out of our head right away. . . . in this field a decision has to be taken. We cannot have more than one system, and on this I am clear.

I warned against Blue Streak in 1957, again in 1958, and very strongly last year, 1959. . . . It has always been clear to me that a fixed site missile was an invitation and not a deterrent, that a liquid fuel rocket vulnerable to a near miss could not be a possibility for us. . . .

We have the V-bombers today. They are a very powerful deterrent. . . . The life of the V-bombers as a credible deterrent gets us to around the middle nineteen-sixties. We have to deal with the position after that. The Minister says that we still have time to take the decision. I think he has to take the decision fairly shortly now.

The method, I think, has to be mobile. It can be from the sea or it can be from the air. I should have thought that the aerial one was still a long way off. We are talking here about something about which people in America are only thinking, not something which is actually within sight. I should have thought that consideration was beginning to point to the sea-launched missile as the only method that can arrive in time. . . .

I have always seen some of the arguments . . . for an independent contribution to the deterrent. They are largely political arguments. . . . They apply to the nose cone and they apply to the war-head but they do not necessarily apply to the carrier. There is nothing like the same argument involved in going into joint arrangements with somebody else about a carrier. If interdependence is to mean anything, I should have thought that here we should say to our American allies, 'We now want to join in all this business of the carrier since we shall not be able to do it ourselves in time and there is no reason why we should and there are no legal obstructions like the MacMahon Act to this in your country.'

Mr Nigel Birch (Conservative)

. . . Nor do I think that we should leave the nuclear club. We have a part to play, and to opt out of it now would cause confusion and weakness at a critical time. However, we ought to be perfectly clear that anything we do with nuclear weapons is done as part of an alliance and never in our purely national interests. That means that Blue Streak should be cancelled forthwith – it will be out of date long before it is in – and it also means that if we are to go on with a deterrent on a mobile platform, either a

submarine or an aircraft, we must do it in full partnership with the Americans and not try to struggle years behind at vast expense, as we have so often done.

Sir Otho Prior-Palmer (Conservative)

I want to give my views about Blue Streak. I have always said that a static deterrent weapon is not the weapon for the future. If we are to have one of these weapons . . . it must be mobile.

Mr J. Grimond

. . . I agree that the Western Alliance as a whole must possess an adequate deterrent, and also that that deterrent must be provided by all the weapons available and not merely the long-range nuclear deterrent. Nevertheless, there is no reason why Britain should make and possess her own nuclear weapons for this purpose. . . . I thought that one of the main arguments for a separate deterrent was that we might need it if other members of the alliance did not want to use a deterrent and we did.

I find it difficult to see what purpose we should serve by maintaining a deterrent under other conditions, especially if . . . the Blue Streak, which is the chosen instrument of the Government, is no good and should be given up. If the Western Alliance can be relied upon it is sufficient if, within it, there is a deterrent. At the moment that deterrent is held by the Americans.

The Minister of Defence used a revealing simile about the position of the Americans and ourselves in this matter when he spoke of the enormous number of nuclear weapons possessed by the Americans and how some of them were rushing down the course while others were breeding and others were in the stable, and so forth. The right hon. Gentleman said that out of all of those we had to pick one little foal, or perhaps not even a foal, perhaps something yet unborn, and to put our money on that.

This seems to be the dilemma of this country and to my mind highlights what is the difficulty of trying to maintain one little nuclear deterrent. . . .

In the meanwhile (the argument against) the concentration by Britain on nuclear arms seems to me to become more and more widely unacceptable. We have heard powerful arguments against it today.

It is more than doubtful that such arms would deter the Russians by themselves or that they add significantly to the power held by America.

Mr John Strachey (Labour)

. . . Bomber Command, our other contribution to the deterrent, is certainly better than the Thor missile, but I put it to the Minister that he should also consider making Bomber Command less vulnerable. He should consider very carefully a world-wide dispersal of Bomber Command, or portions of it, and improving the means of protecting bases for it.

The moral of this is that for a given sum of money which we can spend on our contribution to the deterrent it is far better, far safer, and far more reasonable to provide a smaller deterrent. Smaller that is to say, in the number of launching sites, whether they be bomber or missile bases, but less vulnerable sites. This is at once very much more reasonable and very much less provocative. Thor, at any rate, provides not so much a deterrent as a provocation. We are pointing a pistol at our opponent's heart, but it is a pistol which it is quite easy for him to knock out of our hands in a moment. . . .

It is clear that the right hon. Gentleman's mind is working in this direction, because he went on to talk about the necessity for mobile launchers for our contribution to the deterrent. I was somewhat alarmed when he talked in terms of an airborne mobile launcher. . . . It may one day be a very practical method, but it is doubtful whether it has much reference to what is needed five years hence. . . .

Everything points more and more obviously to the nuclear rocket-carrying submarine as the obvious successor to Bomber Command as the vehicle for a British deterrent. This is not merely an idea – a gleam in somebody's eye; it has been worked out and is actually in existence in the United States of America. It is not yet perfected, but it is thoroughly realistic in terms of what is likely to be the situation five years hence.

I have heard two views on this matter from the experts. Must a submarine designed for the carrying of rockets for delivery of the deterrent

necessarily be nuclearly-propelled? Such a submarine has far more endurance, but is it absolutely necessary? Some experts, at any rate, believe that there is a good case to be made out for a submarine propelled by normal means. . . . The Minister should examine the question whether the role of the Navy should be changed – I am dealing here with nuclear warfare and not with limited conventional warfare. That is a very large proposition, which I realize, would produce much resistance, but the possibility must be faced sooner or later that in nuclear warfare the Navy should be an underwater Navy or nothing.

Mr R. H. S. Crossman (Labour)

. . . The notion that we can conceivably go ahead and have better nuclear forces and better conventional forces and reckon to have a small bill seems to be quite unrealistic. We must face the fact that, if, as I do, we want to have adequate forces in Germany, then we must either pay something approaching £2,000 million, or we must substantially cut something else. As others before us have said, there is nothing else to cut; there is only the possibility of looking at our 'Great Deterrent' and reassessing the value of it to us as a nation and as a member of the Western Alliance.

I criticize our nuclear strategy while making it quite clear that I am not a pacifist and that I recognize the need for a Western deterrent. Of course, so long as we do not have world disarmament, there has to be a Western deterrent, partly nuclear, partly conventional. We are discussing two things: first, the role of Britain and whether or not we should contribute to the nuclear deterrent; and, secondly, the relationship between the nuclear and conventional elements in the deterrent. What I mean by nuclear strategy is the decision to substitute nuclear power for conventional forces or, rather, shall I say, to cut our conventional forces in fact while assuring ourselves verbally that we can substitute for them nuclear power. . . .

There is a great and growing body of expert opinion which has grave doubts about our nuclear strategy and the role of an independent British deterrent.

I indicated what was wrong then and what is wrong today with our nuclear strategy in what I said four years ago. If we make ourselves dependent either on thermo-nuclear weapons or on atomic tactical weapons to the degree that we cannot even fight a second-class war without relying on nuclear weapons, we make ourselves – not strong, but impotent. The main criticism which is directed at the present policy is based upon the increasing impotence not only of Britain, but of the whole Western Alliance, through our perilous cutting of our conventional forces and the easy substitution of the nuclear threat. This never was credible; and it is now totally incredible since we have been overtaken, equalled and now surpassed, by the Eastern *bloc*.

Mr E. Shinwell (Labour)

. . . I have always been concerned about the possibility that we may weaken our conventional forces and strike a deadly blow at the NATO organization if we proceed unduly in the direction of a nuclear strategy. I should like to remind hon. Members, and in particular my colleagues on the Opposition Front Bench, that in the course of preceding debates on defence they have argued that the Government should not place an undue reliance on nuclear strategy.

What is the difference between my colleagues and myself and a number of hon. Members who are associated with me in an Amendment which appears on the Order Paper? We have come to the conclusion that nuclear strategy is no longer practical or feasible.

Mr Frederick Mulley (Labour)

. . . From the military point of view, we must have the capacity to strike a second blow. That means, of course, that not only do we have to have means of delivery of nuclear weapons, but we need to concern ourselves with problems of dispersal, mobility and the hardening of sites. . . .

. . . If the enemy is to believe that we are preparing not for the first strike but for the second, it is essential that our missiles should be credible in the sense that they could survive a first attack.

This is why I do not understand people who criticize the provision of the early warning

devices, because without them, with an open, sitting-target missile such as we have, no one on the other side would believe that we were going to leave the missile there to be destroyed by the enemy. They would be convinced that at some time we would use it first. That is why I do not think that Blue Streak is a very good idea, and I do not think that we can afford to indulge in having independent missiles and independent means of delivery without working in conjunction with our NATO allies.

Sir Fitzroy Maclean (Conservative)

Arguments have been put forward, in this debate and elsewhere, both for and against an independent deterrent. One condition if we are to have an independent deterrent is that that deterrent must be big enough to be credible. There is a minimum size beneath which it must not fall or it serves no purpose. I think there is another condition. There is a maximum cost, and if the price of the deterrent rises above that maximum then for this country it ceases to be feasible and we must abandon the idea of an independent deterrent.

Sir Alexander Spearman (Conservative)

I do not suggest that we should leave the nuclear club. I do not know enough of what the consequences of that would be, but I do suggest that our subscription to it should not be so great as to diminish our other defence activities.

Mr Hugh Gaitskell (Labour)

. . . What is the case for having nuclear weapons under our own control? Here I shall say something with which perhaps the Government and other hon. Members will disagree. I do not accept the view that the case for this is that it strengthens NATO. I do not believe that when we speak of our having to have nuclear weapons of our own it is because we must make a contribution to the deterrent of the West. I explain that simply by saying that, even if, while the V-bombers were ours, the bombs themselves were American bombs – nuclear weapons supplied by the United States – NATO, as such would be just as strong as it is today. There would be no difference to the alliance.

The real case for our having our own independent nuclear weapons is fear of excessive dependence upon the United States. It springs from doubts about the readiness of the United States Government and the American citizens to risk the destruction of their cities on behalf of Europe. It depends also, I think, on fear that an excessive dependence on the United States might force upon us policies with which we did not agree, because we would be in such a weak position to argue with the United States.

My hon. Friend the Member for Coventry, East (Mr. Crossman) suggested, if I understood him aright, that we no longer took the view that the possession of nuclear weapons was of any value in discussing matters with the Americans. I am afraid that I still do think it of some value.

. . . That, I think, is the case for our having our own independent nuclear weapon, but I would not, of course, deny for one moment that there is also a powerful case against it. These are matters of balance on which, frankly, I find it impossible to say that it is absolutely clear one way or the other. We have to weigh them up.

The case against it, first, the simple one of cost and, with that, the argument advanced by many hon. Members during this debate that if we are to go in for, and continue to go in for, nuclear weapons of our own there will be much less money available for other conventional weapons that are also important to us. One accepts that, of course.

There is also the further argument which cannot be ignored, that, if we persist in our view that we must have our own independent nuclear weapon, now, particularly with the availability of nuclear reactors to other countries, there is a very real danger that the spread of nuclear weapons will take place. I do not say that our decision to renounce these weapons would prevent it. What we have said in our proposals for the so-called non-nuclear club is that we ought to be prepared to give up our own independent nuclear weapon if thereby we can stop the spread.

As regards the decision, which must, as I say, be taken on a bal[illegible] between the alternatives of having or not having our own nuclear weapon, the history is perfectly clear. The Labour Government decided to make the atomic bomb. . . . Subsequently, the Conservative

Government decided to make the hydrogen bomb, and, on a balance of advantages such as I have tried to indicate, we decided that we would support that decision.

I must emphasize, however, that this does not mean that we think, first of all, that the balance of our defence expenditure, the allocation of our defence resources between the building up of nuclear power and conventional forces, which the Government have followed, is the right one. That is a totally different issue.

Secondly, I certainly do not say that we ought to go on producing more and more nuclear weapons.

It is, of course, easy to laugh at the Opposition and say that we ought to know and that we ought to be able to decide. I say quite frankly that any serious person who thinks about the matter for a moment must understand that, to a large extent, we are in the dark on this issue. My right hon. Friend asked me what more facts I wanted. I will tell him. I want more facts about costs, to start with. I want more facts about efficiency and effectiveness. I want more information about the attitude of our Allies, what we can get from the Americans, and all manner of things of that kind. I believe that this is the only sensible policy to adopt.

Next, I want to make clear that we are not, of course, saying that we can afford a lot of different nuclear weapons. We certainly do not say that.

(*Mr Watkinson announced the cancellation of the Blue Streak weapon development programme on April 13, 1960.*)

NUCLEAR WEAPONS versus CONVENTIONAL FORCES

Because of the need to meet local emergencies which could develop into a major conflict, conventionally armed forces are a necessary complement to nuclear armaments.

Mr Brown (on this quotation)

It is entirely the wrong way round. If we have to have them at all, conventional forces do not complement nuclear weapons: nuclear weapons complement the conventional element in our forces.

Mr Nigel Birch

. . . In the balance between nuclear and conventional weapons I have always leaned to the side of conventional ones. While saying this, I must make it clear that I think that a Western deterrent is absolutely vital. We must play our part. What we must decide is how best to arrange our affairs, so that we can make the most useful contribution to NATO and also have the right sort of arms for our own more particular, though desperately important interests – the Commonwealth and our friends all over the world. I do not think it can be said that this Alliance is short of nuclear weapons.

Lieut. Commander Maydon (Conservative)

One part of this argument where there is considerable room for difference of opinion is that relating to the balance between conventional arms and the nuclear deterrent. To reach the nuclear threshold requires an immense expenditure of money and manpower. We know how difficult it was to acquire stocks of plutonium.

The warhead mechanism, the vehicle to carry the warhead, launching sites, whether based on land, air, or sea, take much time, much money and many resources. Today we have reached that stage. Now we can afford to go more slowly in that direction and to put much more emphasis, which I agree is necessary, on the conventional side.

Mr John Strachey

Mr Khrushchev's statement that 'the Russian Armed Forces have been to a considerable degree regeared to rocket and nuclear weapons' is the only reason, but a sufficient reason, why our land armed forces on the Continent have to be equipped with some form or other of tactical nuclear weapons.

I have never claimed, and do not claim now – it was a mistake for SHAPE and NATO ever to claim it – that the tactical nuclear weapons gave any advantage to us. This was a frightful error committed by SHAPE and by the Supreme Commander. When, however, the Russian claim – I expect, quite rightly – that their forces have been 'regeared' to rocket and

nuclear weapons, it is simply impossible to leave ours without these weapons. That is the simple reason why one cannot oppose having them.

Mr Christopher Soames (Secretary of State for War)

. . . We are all agreed, I think, that we must make a contribution to NATO and not many will disagree that this must include a tactical nuclear deterrent for the Navy, the RAF and the Army.

Mr Frederick Mulley

. . . I do not believe it is possible to start using tactical nuclear weapons and hope to restrict a war to a limited area or size. I believe that once tactical nuclear weapons are used it will be very difficult indeed to stop a whole nuclear conflagration in which we were all concerned. Since the Soviet have tactical nuclear weapons, just as they have strategic nuclear weapons, we have to have them too in order to preserve the stalemate. . . .

I believe that not only in this country but in NATO has there been undue dependence on strategic nuclear weapons. I think that NATO is well on the way to correcting the balance, and I can only hope that the Minister of Defence will do so in this country.

Mr Austen Albu (Labour)

. . . As to joint possession, I am not sure even that the tactical use of atomic weapons by NATO would be possible in the near future, because the difficulties of political control are so great, apart from anything else. For the time being it would be far better to remain under the umbrella of the American deterrent. The money which is being wasted on research and development in this respect would be much better spent on bringing our NATO forces up to strength and improving the efficiency of our conventional forces.

If I understood aright the figures given by the Secretary of State for War, it is clear that we could increase our expenditure on weapons for conventional forces by about 25 per cent if we gave up the deterrent. I would have thought that an increase in the provision of weapons and an increase in the efficiency of our conventional forces by 25 per cent would be well worth having.

Sir Alexander Spearman

. . . I can sum up what I have tried to say in two short sentences. I believe that the nuclear contribution we could afford to make could not be decisive. I believe that the conventional contribution that we can make could be decisive in preventing war.

Mr Hugh Gaitskell

We have repeatedly, year after year, criticized the Government for putting too much emphasis on nuclear weapons compared with conventional weapons.

. . . In theory, of course, we ought to have such a force as will be able to contain any attack. We ought to have the deterrents, as it were, at different levels; but the fact is that the whole strategy of NATO is so based on nuclear weapons now that there are the gravest doubts as to whether we could adequately contain, not a major conventional attack, because I think that very unlikely, but some development out of friction, dispute and conflict in which conventional weapons are used.

I do not say that we should have no nuclear weapons – of course not. The Russians have them and we should have them. But I say that at least the threshold on which we contemplate their use ought to be a great deal higher than it is now. There ought to be a higher proportion spent on conventional forces and a smaller one on nuclear weapons.

MOBILITY

Rapid mobility has become of the greatest importance, so that reinforcements can be brought to trouble spots before the trouble has time to spread into a major conflict.

Mr Watkinson

The facts are that in this part of the examination of defence, re-equipment is going as planned and is giving us the greater mobility and flexibility which we need. The new model

all-Regular Forces, for which we all owe so much to my right hon. Friend, will have at their command a degree of transport ability and striking power such as we have never achieved before in our military history.

Captain John Litchfield (Conservative)

. . . Another change which has been mentioned is, strategically speaking, the shrinking in our overseas bases, a process which has already gone a long way and which looks like going a little further. That is why I am so glad that there are several references in the White Paper to the importance of mobility. If we can get our forces on a basis of true mobility and flexibility we shall have gone a long way to overcoming the serious strategic effect of the loss of bases which, for one reason or another, we have had to give up. On the subject of mobility, I hope that my right hon. Friend will give serious thought to a matter which merits consideration, the reinstitution in peacetime of at least an embryo fleet train.

Mr Michael Hamilton (Conservative)

It is, of course, an axiom that the smaller one's forces are the greater must be their mobility. Three nicely phrased paragraphs in the Report make it appear quite a straightforward problem – a few more Britannias in the air and we are home – but, in practice, I believe the Minister will find this problem of mobility more complex than anything with which he met in the Ministry of Transport. . . .

Sir Otho Prior-Palmer

It is vital that our strategic reserve should be moved at speed. What worries me is the necessity to man, maintain, and stockpile dumps in various parts of the world to which troops will be flown. Most of these dumps and stockpiles are in countries where nationalism, quite rightly and legitimately, is beginning to show.

I do not believe that we can rely on keeping those bases for any length of time unless they are on friendly territories bound to us by treaty, such as Turkey. I believe that they are a hostage to fortune. I am, therefore, delighted to see that at last – and I have been saying this for three years – we are to have a Commando Carrier. We must proceed step by step towards floating bases. We must have floating bases not only for commandos, and a helicopter or two, but for tank workshops, ammunition stores, and everything that is required for a small integrated force. That is the object towards which we should move, and I am grateful for the first step that has been taken towards achieving it.

Mr Geoffrey de Freitas (Labour)

Let me summarize my points in this way. More and more, the Army depends for its effectiveness on the transport provided by the other two Services, but neither of the other two Services spends much time thinking about transport problems. They are concerned with their fighting capabilities, and not with their effectiveness as common carriers. Therefore, the Army must be encouraged to have more of the implements of aerial mobility, and begin by studying what the Russians are doing.

Commander J. W. Maitland (Conservative)

We now have a commando carrier and we have been promised another one. We are told that we are improving – but it does not seem to be very fast – our capabilities for moving troops quickly by air. But there is no sign of a real inter-Service integrated reserve, living and training together, with landing craft, transports and store vessels working together. Such a force need not be large.

Mr Austen Albu

I agree that instead of putting money into these bases we should use it to make our Army more mobile and efficient. To suggest, however, as some hon. Members opposite have done, that we can somehow put our whole Army afloat and that it can in some way perform the functions of the garrisons which used to be stationed throughout the world, seems to me as an amateur logistic nonsense.

Book Reviews

THE UNCERTAIN TRUMPET

General Maxwell D. Taylor:

Harper & Brothers, New York, 1960. $4.

Stevens & Sons, London, 1960. 30s

General Taylor's book has already given rise to a good deal of excitement in the USA. Not least because it includes the text of the article he wrote for *Foreign Affairs* in 1956, and was not allowed to publish together with the comments made upon it at the time to the State Department's 'censors'. British readers may find it more surprising that the Chief of Staff of one of the armed forces should have thought it possible to publish an article of a highly controversial kind which strongly conflicted with the official view of the US government. Again while they will sympathize with the difficulty confronting the service chiefs of staff when they have to appear and testify before Congressional Committees in favour of military programmes with which they may in fact partly disagree, they will find it hard to accept General Taylor's solution that the chiefs of staff should be made the military advisers to Congress as well as to the Secretary of Defence and the President; indeed, it is hard to see how this could contribute to improving the machinery for making military policy which is one of General Taylor's principal desiderata. Nevertheless, British readers will probably find that it is in describing how the American machinery has actually worked in the past decade that General Taylor's book is most useful. For his own strategic thinking will not be unfamiliar or (in most quarters) unwelcome. His belief that over-concentration on the 'great deterrent' as a result of the adoption of the policy of 'massive retaliation' has dangerously weakened the United States for the kind of war that it is more likely to have to face, and that the official distinction between limited and general wars is misleading will not be unfamiliar here, and the arguments with which General Taylor supports his views and his own alternative policy of 'flexible response strategy' are parallel to those so powerfully advocated here by Admiral Buzzard. The detailed scheme of priorities for the future are of course directly related to American problems and resources, though the importance of their reactions upon America's allies is fully brought out. Believing as he does that the next three or four years are likely to be the most dangerous because of the 'missile gap', General Taylor divides his recommendations into short and long-term ones. His 'quick fixes' are: improved planning and training for limited war including the provision of an inter-service command to plan the utilization of appropriate forces now spread between the three (or should it be four) services; the exploitation of the IBRM; better protection for SAC and a limited fall-out shelter programme. This would dovetail into a long-term programme which would involve a redefinition of the roles of the services, and an attempt to get away from the difficulties caused by the fact that while operations normally involve all of them, the budgetary process forces them to make their claims separately, and has led to the stabilization of their respective percentages of the military budget at a time when the problems they have to face are in constant flux.

Why this should have been so is explained in the earlier chapters of the book where General Taylor traces how the concept of massive retaliation was first adopted, and how it was that even when Mr Dulles opened the way to some revision of it in 1956, this was hardly reflected in the priorities given to the various parts of the programme.

Discontent with the assumptions upon which planning was based was first manifest in the army, though later on the Navy and marines began to come round to the view that limited wars remained a real possibility and that nuclear weapons were not the answer to every situation. It proved however very difficult to get any serious amendment to the very general directives in the NSC's basic annual paper 'Basic National Security Policy' or to its counterpart on the Chiefs of Staff side the 'Joint Strategic Objectives Plan'. This is largely because, in General Taylor's view, there is no place in the machinery where the views of the Chiefs of Staff collectively can be taken into account in making policy and in particular in framing the budget. The responsibility for this is partly the view taken by Eisenhower when, on coming into office, he changed the entire team, on the grounds that the Chiefs of Staff should be instruments of a particular policy, itself determined politically. Truman's chiefs could not be trusted with executing the Eisenhower policies. In these circumstances the separate service chiefs have been made subordinate to their chairman, 'the personal choice of the Secretary of Defence,

with whom he is in close physical and spiritual *rapport*'. He has in fact 'come to be a sort of party whip, charged with conveying the official line to the Chiefs in the hope and expectation that they will be guided thereby in their actions'.

It is therefore not surprising that whenever the service chiefs disagree and refer their disagreement to the Secretary of Defence, the side favoured by their chairman is pretty certain to come out on top. More serious is the fact that no serious discussion between the Secretary of Defence and the Chiefs themselves normally takes place. Instead of working out a military policy and fighting for the resources necessary to implement it, the Secretary of Defence is primarily concerned to keep military expenditure under an artificial 'ceiling' imposed for political reasons. The bureau of the budget is thus more important a factor than the service departments themselves, and President Eisenhower's monetary dogmas are the most important considerations of all: 'the determination of United States strategy has become a more or less incidental by-product of the administrative processes of the defence budget' – hence its dangerous lack of flexibility. We assume that America's enemies do not suffer from this disability – do her allies? A similar critical study of policy in this country – names and all – might be very valuable. But we are most unlikely to get it.

MAX BELOFF

ASSAULT AT ARMS, a Policy for Disarmament

General Sir Ronald Adam and Charles Judd:

Weidenfeld and Nicolson, London. 5s

THE DIPLOMACY OF DISARMAMENT

Joseph Nogee:

International Conciliation No. 526

Carnegie Endowment for International Peace

Books about disarmament, for the most part, are of two sorts: advocacies of disarmament policies, and histories of disarmament negotiations.

The disarmament enthusiast views the history of these negotiations as a series of 'lost opportunities', earnest grapplings with technical problems, acts of folly or moral spinelessness. He does not ask himself what these negotiations are about, why they fail, or why they are held at all. Nor, if he did, would existing histories much help him, for though they contain valuable records of events with which we need to be familiar, they do not rise from the level of description to that of explanation. It is the merit of Mr Nogee's pamphlet that it does this: it treats disarmament negotiations as part of international politics, and disarmament policies as subordinate parts of the foreign policies of states. In a suggestive chapter on 'The "Gamesmanship" of Negotiations' he rightly shows that the satisfaction of public opinion is the main cause of the persistence of these negotiations, and that a nation's disarmament plan has two characteristic elements, one calculated to have a wide popular appeal, and the other calculated to make the plan inacceptable to the other party, thus ensuring that the negotiations fail and that the onus for their failure is placed upon that party. It does not follow from this that disarmament negotiations are a mere fraud: most governments, in most negotiations, do want an agreement, if it can be had on their own terms: but what all of them must do in all negotiations is play their appropriate public roles.

General Sir Ronald Adam and Mr Charles Judd have written a book of the other kind. What, in relation to disarmament policy, can a private person or body usefully advocate? Not, surely, as these authors do, a detailed plan: plans are the business of governments, and their details can and should only be determined not by reference to abstract principles such as 'fairness', but by the push and pull of negotiation. However, private persons can and should ask themselves whether or not, why and how governments should pursue disarmament. The answer of these authors is that Western governments should work for a general and comprehensive agreement: such an agreement is the one most likely to strengthen international security, and it is the one most likely to be acceptable to the Russians, since they have consistently championed an agreement of this kind (is this the Russian 'joker'?).

The case for a general and comprehensive agreement is that the arms race is general and comprehensive: it is the product of all the Powers and of all the varieties of armed power. A mere partial agreement would allow the arms race to go on, ending competition only in a certain area. Whether the logic of this is sound or not (there are reasons for doubting whether a treaty, which can limit only specific sorts of armed power, can be genuinely comprehensive), there are strong grounds for the opposite view, that only a policy directed towards some kind of partial agreement is likely to strengthen international security now. In a world like ours, the more comprehensive a disarmament proposal, the more it restricts the freedom of Powers to engage in the arms race, the less likely they will be to reach agreement upon it. Moreover, in this world, international security rests primarily on a balance of power; a policy aimed at abolishing power, or at confining the balance precariously within the terms of a treaty, is of doubtful relevance. It is arguable that whatever modest contribution arms control may have to make to international security lies in the acceptance of a balance of power, and the attempt to make it more stable than it would otherwise be by limiting certain of its more dangerous aspects. Such an agreement would not

necessarily involve the massive reductions of armaments which Sir Ronald and Mr Judd have in mind. They do not deal with the view, now a staple of the American disarmament debate, that the nuclear stalemate is the chief source of international security, and that the concern of arms control should be not to dismantle it but to preserve and perfect it. Nor do they consider, in advocating the large-scale and prior reduction of conventional forces, whether such a step, in reducing the range of military alternatives available to the major Powers, would not make nuclear war more likely. '"Partial disarmament" plans,' the authors complain, 'are in fact made to be subordinate to military plans' (p. 29). They are inclined to see arms control and military preparations as exclusive alternatives. But if the proper object of both is international security they can, when both so shaped, be complementary.

HEDLEY BULL

THE RACE AGAINST THE H-BOMB

Denis Healey, MP.

Fabian Tract No. 322. 2s

Mr Healey, who is now the principal spokesman of the Labour Party on international affairs, is one of the relatively few people in Britain who have consistently brought sense, imagination and realism to the study of contemporary strategic problems. He is well known on both sides of the Atlantic for his contributions to the great debates upon the future of Western policy, and in particular as one of the few hard-headed advocates of 'disengagement' in Europe. In this pamphlet, frustrated it may be in any hope of making much progress with the idea of disengagement at present, he turns to another question with which, in his own mind at least, it has always been close linked – namely the spread of nuclear weapons to other powers besides the existing four that hold them.

Drawing on analyses that have recently been published in the United States, Mr Healey emphasizes how rapidly the potential capacity to produce nuclear weapons is spreading outside the charmed circle of those that already have them. There are eleven countries that have the necessary skill and resources to produce them within the next five years: eight more could do so with the help of additional scientific manpower: and another six would need only a modicum of industrial and scientific help to do so, giving, with the existing four arrived nuclear powers, a total of twenty-seven nations in the world, out of the forty which have already embarked on one kind of atomic reactor programme or another.

If there were any close correspondence between the intentions of the countries and their capacities, this prospect would be an appalling one, for as Mr Healey rightly says: 'Peace cannot be secured by universal terror'. But whether he is right to assert that 'the most urgent problem facing mankind is to stop the spread of nuclear weapons' depends on a judgment as to how close an alignment of capacity and intention there really is likely to be. The problem can be broken into two halves: whether Western countries or those within the orbit of the American security system, in addition to Britain and France, will decide to become nuclear powers: and whether China will become one and thereby inevitably India, Japan, and possibly Indonesia as well.

It is on the first half of the problem that Mr Healey concentrates most of his attention. He finds the nub of it in the probable decline in the counter-force capacity of the United States – that is to say her ability to cripple the sources of Soviet offensive power, airfields and missile bases, thus removing the credibility from any threat to retaliate against the Soviet Union for an attack on an American ally. This in turn tends to convince the allies – as the French now argue – that they must individually have the power at least to threaten Soviet cities with their own nuclear weapons in order to deter attack upon themselves. Mr Healey somewhat overstates the danger. It is not true, for instance, that 'European countries, led by Britain and France, are beginning to produce strategic atomic weapons for themselves', for so far no other countries have announced such plans. Moreover, he makes no mention of the delivery problem, of the difficulty of producing planes or missiles which can penetrate Soviet defences. These require an even more elaborate scientific and technical base than the manufacture of nuclear weapons themselves, as British experience has proved, and may prove a more effective brake on governments than the restriction of nuclear material or technology. Finally, the diminishing importance of the civil reactor, owing to its high costs of operation, as evidenced by the virtual collapse of Euratom in the last year, removes for the immediate future some of the urgency from the problem. But the danger is real, and if it is not as urgent as Mr Healey suggests, time is not on the side of civilization. There is, as he points out, no alternative to an international treaty which would prevent the production of weapon grade materials, in other words a strengthening of the International Atomic Energy Agency, an imaginative project which has been rendered sterile by Soviet indifference to the problem.

In dealing with the question of European security, which is the root cause of the diffusion of nuclear weapons (though its effects would be more dangerous in Asia), he is on more contentious ground. Mr Healey rejects the concept of a nuclear sharing in the form of a NATO or a European deterrent (it is not clear that he has studied the distinction between the two concepts), and pins his own hopes on agreement

with Russia for a zone of limited armaments in Europe. This is extremely well argued, its one weakness being his neglect of the zest with which the Russians have multiplied their own destructive power in Europe in recent years. It is true that a secondary arms race in Europe, subsidiary to the main Soviet–American one, creates a high degree of tension with NATO itself. The difficulty is to know why the Russians, aware of this, should be interested in limiting it, unless NATO by a considerable effort can show that it can produce its own internal system of arms control.

But contention is Mr Healey's daily fare, and all those who are concerned with the future of international security will find these twenty pages most stimulating and informing.

ALASTAIR BUCHAN

SCIENCE AND TECHNOLOGY IN CONTEMPORARY WAR

Major-General G. I. Pokrovsky:
Stevens & Sons, London, 1959. 30s

Few Soviet books are at present available in English on military thinking in the USSR about contemporary and future weapons such as long-range missiles, vertical take-off aircraft, atomic-engined submarines and atomic-powered aircraft. General Pokrovsky's book is therefore welcome and we are indebted to Dr Raymond Garthoff for a readable translation. It was first published at the end of 1956 through the Soviet Defence Ministry and the English version also contains the addendum of a pamphlet published at the end of 1957 by Pokrovsky. George Pokrovsky is a Soviet Army man, a nuclear physicist, a member of the Academy of Artillery Science and a senior instructor at the Zhukovski Air Engineering Academy; that is he has status.

There are inevitably disappointing elements in his book. When he discusses short and long-ranged missiles and rocket and other weapons, he illustrates entirely from American examples. The reader is offered comment on the Nike and the *Nautilus* with never a mention of even such well published, well established Soviet weapons as Mig fighters, Yak and Mil helicopters or the T1, T2 series of Soviet missiles. For the student of detailed Soviet weapon developments the cupboard is indeed bare. There is also the annoying but inevitable tendency to drag in such things as imperialism and 'reactionary tendencies' into a discussion of military weapons. One always hopes that the wise sayings of Marx and Engels will not intrude on current considerations of artillery, rockets and aircraft. The reader may also find it odd that a scientist discussing contemporary weapons, who roundly declares that the 'Great Fatherland War of 1941–1945' is out of date, manages nevertheless to dig back beyond Peter the Great as far as Ancient Rome in search of illustration.

The much more serious point however is how far Soviet weapon development since 1956–57 has overtaken Pokrovsky's book. The Khrushchev statement on Soviet defence policy to the Supreme Soviet earlier this year, the Soviet long-range rocket tests in the Pacific and the successful launching of the Luniks may have made Pokrovsky obsolescent within the three or four years which have passed since he wrote this book. Nevertheless he has some important things to say which suggest that there are doubts and uncertainties amongst those who formulate Soviet defence policy. While stressing the major importance of long-range rockets he points out that they can only destroy those targets whose co-ordinates are known in advance and adds therefore that they cannot destroy mobile targets. And on guided missiles he makes the point that 'enemy jamming may knock out the guidance for the missile leaving the operator powerless to operate'. Even more interesting is his comment on the future of manned bombers. It comes after all from a Soviet Army artillery specialist. Pokrovsky believes that the manned bomber can deliver its atomic load on to the target more accurately than the missile. He points out that if a long-range rocket is used, the location of the target on the map must be sufficiently accurate for it to be really pinpointed and adds 'the enemy can by various means make the location of the targets difficult to determine'. Remembering that this is text book stuff for the Soviet Armed Forces, one can reasonably assume that the Kremlin has some weapon problems on its hands.

For those who believe that Soviet ground forces may be initially employed in night attacks there is the interesting comment from him that 'the means for carrying on military operations at night, in fog, etc., are seriously needed'. On tactical atomic warfare he draws attention to the need for reconnaissance to locate well camouflaged and mobile targets (this surely means air reconnaissance) and he mentions the role in the future of fighters with rocket boosters which can be employed without the need for conventional airfields. This as he says elsewhere means the development of vertical take-off aircraft.

On a broader front he confirms the well-known Soviet switch to strategic weapons which he says it would be a great error to under-estimate in a future war and makes this interesting comment 'It is strategic weapon systems which can most of all lead to the unexpected in military affairs . . . development is moving so swiftly that in several years it can completely change the whole character of warfare . . . bringing great masses into the conflict and even extending the area of combat into the near reaches of outer space'. In this and other contexts he confirms what General Gavin has affirmed that the earth satellite has a potential military future.

Much of this short book is realistic and well

reasoned. It begins with a gem of under-statement 'Contemporary war is a very complicated process'. If one is allowed to read between the lines (what other way is there of reading a Soviet publication?) one can reasonably deduce that there are a number of aircraft and rocket planning headaches at the Kremlin.

ASHER LEE

DEFENCE – POLICY AND STRATEGY

Air Vice-Marshal Kingston-McCloughry:

Foreword by Alastair Buchan

Stevens & Sons, London, 1960. 25s

In this book Air Vice-Marshal Kingston-McCloughry analyses the machinery of British defence He explains with considerable care the evolution of the Ministry of Defence from the moment when Mr Churchill became its first Minister in 1940, and he uses his material as evidence to support the view that there should be more centralized planning. He points out that in the nuclear age the role of the politician has assumed an entirely new character and concludes that the division of military responsibilities between a series of service ministries and service chiefs has become an anachronism. There is no longer any such thing, he emphasizes, as a purely military decision, let alone one for which individual services can or should be held responsible.

The book starts with an outline of the interaction between foreign affairs and defence policy. It goes on to discuss the needs of the various categories of war, as well as the changes in strategy which have been brought about by technical advances. There is a chapter on the role of Britain within the Western alliance and others devoted to each of the services. This is a detailed attempt to take a new look at the problem as a whole and Air Vice-Marshal Kingston-McCloughry is well qualified to take it.

RICHARD GOOLD-ADAMS

SOVIET SPACE SCIENCE

Ari Shternfeld

Translated from the Russian. Hutchinson. 30s

The title of this book is misleading, because it contains remarkably little specifically about Soviet space science. In fact, many of the photographs and virtually all detailed information about rockets, and launching and testing facilities, refer to American projects. After reading this book one is very little the wiser about Soviet rocket and satellite developments beyond what is already general knowledge in the West.

This is, perhaps, not surprising. The curtain of security which surrounds Russian rocket and satellite work remains as impenetrable as ever, and it is not to be expected that it would be lifted for a semi-popular textbook on 'space science'.

For that is what the book is – and of its kind, it is excellent. It is aimed at the serious student of rockets and satellites, somewhere between the professional expert and the complete layman. Some of the best chapters are on the complicated subject of satellite motions and various orbits. The explanation is lucid and there are many helpful diagrams.

The sections on the construction of satellites and of launching rockets are disappointing, consisting largely of familiar generalities, and containing virtually no indication of any specifically Soviet approach to these problems.

The author has drawn heavily on papers presented to the annual congresses of the International Astronautical Federation, where the borderline between science fact and fiction tends to become very ill defined. Some fairly spectacular 'artists' impressions' of space stations and interplanetary rockets are reproduced, but the author's comments are fairly sober, and he gives careful descriptions of the serious scientific studies of the fringe of the atmosphere and of space itself which are now going on.

He has some stiff remarks to make about the military applications of satellites, quoting American proposals for bomb-carrying and reconnaissance satellites. He acknowledges that reconnaissance and telecommunication satellites are probably feasible, but says: 'We are firmly convinced that it will not be necessary to shoot down military artificial satellites since the public opinion of the world would prevent their construction'.

It is a thick book, which has been competently translated by the US Air Force Technical Documents Liaison Office. Considering how little new information the book contains (and it has inevitably been overtaken by events), it is surprising that the Air Force took all that trouble. Now that it is translated, however, it is a useful reference book and space-age primer, lucid, and remarkably free from propaganda.

JOHN DAVEY

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